TEACHING VOCABULARY TO PRESCHOOLERS WITH DISABILITIES USING ADULT-CHILD SHARED BOOKREADING: A COMPARISON OF TRADITIONAL AND ELECTRONIC BOOKS

by

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ABSTRACT

This study sought to validate adult-child shared storybook reading as a method for teaching target vocabulary words to preschool children with disabilities. The Vocabulary Learning through Books (VLTB) instructional procedure incorporates, adult-child book reading, questioning during reading requiring the child to answer with a target word, and least to most prompting with verbal reinforcement for required answer. Both a traditional book and e-book was used with the VLTB procedure. Five preschool children completed the study. A single subject research Adapted Alternating Treatment Design (AATD) was used for this study. Progress was measured by daily intervention data and weekly expressive and receptive probes. All children were able to learn target words as measured by daily intervention data, which consisted of the child answering a definition question with the target word. However, only 3 of the 5 children were able to meet daily intervention probe criteria. Two met criteria with Intervention Phase I, least to most prompting. Three children were unsuccessful with least to most prompting, and moved to Intervention Phase II, simultaneous prompting. One child met criteria with Intervention Phase II. Only one child met criteria on the weekly receptive probes. One child was able to define 5 of 6 target words, and another child was able to define 1 word. The other 3 children were unable to define any target words. None of the children met criteria for weekly receptive probes. Two children displayed a faster rate of learning for the traditional books as measured by intervention data and weekly probes. One child displayed a faster rate of learning for the e-book for daily intervention data and for the

traditional book on receptive weekly probes. One child had a faster rate of learning for the traditional book for daily intervention data and slightly better on e-books for receptive weekly probes. One child showed no preference between book types.

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Literacy, simply defined as the ability to read and write, is an important skill for life. It is necessary to learn to read and write to do many important tasks; from reading street signs and filling out job applications to writing papers for school, good literacy skills are needed every day. However, in the United States, it is estimated that 14 percent of adults do not have basic literacy skills (U.S. Department of Education, 2007). Adults who lack literacy skills are less likely to graduate from high school, have full-time employment, and be involved in their community. It is clear why teaching literacy skills is a key component of public education. However, even as such, it is evident from these statistics that not all students are learning this basic skill.

Much attention has been paid to literacy instruction in recent years. Current legislation requires all children are able to read at grade level by the third grade (No Child Left Behind (NCLB) Act of 2001). This legislation applies to all children, including those with disabilities, because being literate is such an important skill for future success. The U.S. Department of Special Education Individuals with Disabilities Education Improvement Act (IDEA) (IDEA, 2005) is another law with literacy interests. This law specifically relates to children with disabilities. Goals to address literacy skills are required to be considered for every child on an Individual Education Program (IEP), starting in preschool through transition services. Beginning in preschool, literacy is an

important component of the curriculum. The United States Department of Education (2002) has named early language and literacy growth, which lead to future academic achievement, as one of the purposes of preschool education. Restated, language is a necessary prerequisite for continued success in school. Good language skills aid in formal reading instruction, making it easier for a child to learn to read (see Dickinson, Golinkoff, & Hirsh-Pasek, 2010; National Early Literacy Panel, 2008). Having a good language foundation, including a large vocabulary, can help children understand better what they read. With better understanding of what they read comes more comprehension (Justice & Pence, 2005). This creates a cycle, as a person has the language skills to read, they will read more, which leads to larger vocabulary and better reading comprehension and so on.

Early Development

Much of a child's development in the areas of social, physical, cognitive, and language takes place early in life. The first years make a foundation on which more complex skills can be learned. Literacy skills are built on a foundation of early experiences and exposures. Literacy is comprised of explicitly learned skills and is not a developmental milestone. It is not learned passively or as a part of natural development but only acquired with careful instruction (Justice & Kaderavek, 2004). Although conventional literacy skills (i.e., decoding, reading comprehension, spelling, writing) are not taught until kindergarten and beyond, there are necessary precursors to learning conventional reading (NAEYC/IRA, 1998). Emergent literacy is one term used to label this prereading skill set. The National Early Literacy Panel (2008) defined acquisition of emergent literacy skills as an objective that occurs before and is related to or predictive of a later conventional reading ability. Many studies show a positive correlation between

emergent literacy skills and later literacy achievement, meaning the better a child performs on emergent literacy tasks, the more likely a child is going to read and write effectively (e.g., Dunst, Trivette, & Hamby, 2007; NAEYC/IRA, 1998; National Early Literacy Panel, 2008; Stahl & Murray, 1994; Whitehurst, Epstein, Angell, Payne, Crone, & Fischel, 1994).

Language is another key area of early development and a component of emergent literacy. Without adequate language (oral and/or written) skills children are more likely to have difficulties during their school career (Catts, Fey, Tomblin, & Zhang, 2002; Dunst, Trivette, & Hamby, 2007; Felton & Pepper, 1995; NAEYC/IRA, 1998). Because most children with disabilities have difficulty in the areas of language, vocabulary, and late emergence of words, they are especially at risk for falling behind in literacy skills (Catts, 1993; Rice, Buhr, & Nemeth, 1990). Targeting early intervention for language equals early intervention for literacy (Catts, 1993; Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003; National Early Literacy Panel, 2008).

As children increase their language skills they increase their ability to become better readers. In early childhood this can be accomplished with effective emergent literacy activities such as adult-child book reading. Reading books together is a way to develop fundamental emergent literacy skills. These skills are linked to advantageous future reading outcomes for children (Dunst, Williams, Trivette, Simkus, & Hamby, 2012; Ezell & Justice, 2005; Justice & Kaderavek, 2004; Kadervek & Justice, 2002; Whitehurst et al., 1994; Whitehurst, Falco, Lonigan, Fischel, Valdez-Menchaca, Caulfield, 1988; Whitehurst & Lonigan, 1998).

Relationship between Language and Literacy

Oral language is one of several emergent literacy skills that are correlated with later literacy and school performance. Several studies have shown language skills are a predictor of later reading skills and academic success (see National Early Literacy Panel, 2008). However, preschool age children vary greatly in their attainment of language skills. By age 5, children have learned an estimated 8,000 to 15,000 words or learned an average of 5 new words a day (Anderson & Freebody, 1981). This large range or difference in number of words learned is due to many factors including a child having disabilities, family socioeconomic status (SES), home experiences, and mother's educational level (Hart & Risley, 2003). For children to maximize their potential, they must be given the best advantages, especially early in life.

Scarborough and Dobrich (1994) identified oral language as a "well-established precursor to difference in literacy ability" (p. 248). Vocabulary development is one measurement of language ability. Current research indicates that complex vocabulary tasks, such as defining words, are a better predictor of later literacy achievement than overall language skills (Justice, Meier, & Walpole, 2005; National Early Literacy Panel, 2008). Defining words is a complex skill that requires vocabulary knowledge and semantic knowledge of how to form a definition sentence (Snow, 1990). There is much research in the area of teaching language and vocabulary to children with primary and secondary language impairments (see Law, Garrett, Nye, 2004; Roberts and Kaiser, 2011) but not in the area of shared storybook reading. Previous research has been conducted into teaching vocabulary to young children during adult-child shared storybook reading, but research has focused on typically developing children or at-risk

children, not specifically children diagnosed with a disability. In addition it can be difficult to engage children with special needs in emergent literacy tasks, so special attention needs to be focused on this problem (Kaderavek & Justice, 2002).

Vocabulary Knowledge

Vocabulary is an important part of language growth. Most of a child's overall language skills can be assessed from vocabulary levels. Early in life most of a child's words are learned from an oral context, but as a child grows written text provides a bigger source of novel words (Beck, McKeown, & Kucan, 2002). This is because books provide more complex vocabulary and narrative syntax different than occurs in typical oral language.

To measure vocabulary skills, it is important to know when a word is learned and how it is learned. Both of these issues are multifaceted and theoretical. How does a researcher know when a child has learned a word? It is generally regarded that knowing a word means a person is able to use and define the word correctly (Beck, McKeown, & Kucan, 2002; Justice, Meier, & Walpole, 2005). Beck and colleagues (2002) listed the steps for this to happen. Initially a person must have been exposed to the novel word; this may be the word in written or oral form. Next, a person may be familiar with a word (it sounds familiar), but not be able to define or use it. After they have more exposures to the word, they will be able to define the word, but may not use it. They have receptive knowledge of the word, before expressive. In addition to vocabulary specifically, receptive language in general is assumed to develop before expressive vocabulary. Finally they are able to use and define the word. There are also words of different difficulty, words that build on each other. It is difficult to understand the word

"enormous" before understanding the word "big." Also, a child is more likely to have more exposures to the word "big" than "enormous," which may also make "big" an easier word to learn than "enormous." As is stated below, repetition is an important aspect to vocabulary learning. Typically, the more children are exposed to a word, the faster they will learn it.

The fact that children learn so many new words in a relatively short time is impressive. Fast mapping ability is the concept that children learn novel words with only a few exposures. The idea is that children need only a few interactions with a word for it to become part of their vocabulary. It has been observed that children can make a place for a word in their lexicon after only one exposure to a word (Carey, 1978; Rice, 1990; Rice, Buhr, & Nemeth, 1990). Although fast mapping of words is not the same as full comprehension of a word, it may be the first step. This fast mapping accounts for children being able to make an association of a new word. They may realize the type of word it is (e.g., noun, verb) or other aspects. As the child is repeatedly exposed to the word, it then becomes part of the child's vocabulary in which the child not only recognizes the word, but understands and uses it. At this point a word is recognized as learned and can be measured with a task such as defining the target word.

Learning Language through Social Interactions

Joint attention is a developmental skill children establish so they can learn higher level skills, including communication and language. Joint attention means both the adult and child are focused on the same object. Cain, Rudd and Saxon (2007) have developed a three phrase process which they have named Focus, Follow, Talk® for teaching care givers to increase the frequency and duration of joint attention opportunities. Focus

means focusing on the object the child is attending to. Following means following the child's lead. Talk means the use of language stimulation techniques to communicate with the child. Their research indicates that when adults are successful in increasing their joint attention with toddlers, there is a correlation to a rise in the child's language (Cain, Rudd, & Saxon, 2007; Rudd, Cain, & Saxon, 2008). Also increased use of joint attention, with participation from an adult and child, has been correlated to an increase in vocabulary size (Tomasello & Todd, 1983). For children to take advantage of any of the adult-child book reading benefits, a child must be able to focus and attend to the book reading task (Ezell & Justice, 2005). The social integrationist theory is one current theory of language development that describes the child as an active participant in language learning and emphasizes that children need social interaction from their environment to develop language (Cazden, 2001; Vygotsky, 1978). This theory emphasizes the importance of the role of the environment and social context in which a child learns language skills. Therefore, an environment supportive of social interaction will lead to stronger language skills.

Bruner (1981) suggests that children learn the aspects of syntax and semantics language through pragmatics or the social use of language. As an example he states that on a developmental scale, joint attention, first noticed by sustained eye contact, occurs before back and forth babbling conversation between child and caregiver. The social aspect, such as joint attention, in the parent/child relationship will develop before pre-intentional communication. These high quality adult and child interactions are the time when children are being exposed to new words and mapping them into their lexicon (Kaderavek & Justice, 2002). Snow (1972) found that young children whose mothers

were more verbally interactive with them had stronger language skills. Typically developing children are able to map word types, vocabulary, semantics and syntax from high quality conversations. As the child grows and learns, the adults learn to adapt these interactions to become more complex, so the child learns new skills. This is referred to as scaffolding (Justice & Pence, 2005) and is based on Vygostsky's zone of proximal development, the idea that adults can build upon what a child knows (Vygotsky, 1978).

Adult-child book reading can be high quality interaction, a time when children are able to learn language. Under the social integrationist theory, the interactions of the social aspect of book reading paired with the cognitive skills of the child result in the learning of new language and vocabulary. Several studies have shown that carefully planned active interactions of storybook reading are an effective way to learn language skills and new vocabulary (e.g., Ezell & Justice, 2005; Justice, 2002; Justice, Chow, Capellini, Flanigan, & Colton, 2003; Justice & Pence, 2005; Kaderavek & Justice, 2002; Sénéchal, 1997; Sénéchal, Thomas, & Monker, 1995; Whitehurst et al., 1988; Zucker, Moody, & McKenna, 2009). Reading aloud is especially important for preschool children who are unlikely to be able to read a book themselves to gather information from the text (Beck, McKeown, & Kucan, 2002).

Adult-child storybook reading can be accomplished in different ways. For example, certain research focuses on learning specific vocabulary words while other studies focus on overall language growth. Adult-child storybook reading will be discussed in the following section along with the different methods for teaching vocabulary.

Adult-Child Shared Storybook Reading

Consistent with the social interaction theory of language development, adult-child storybook reading provides opportunities for children to develop important foundational skills. From being read to, children learn about a variety of emergent literacy and language skills such as how to hold a book, how to turn pages, that text goes left to right and has meaning, and that letters make up words and have sounds (Ezell & Justice, 2005). While being read to, children have the opportunity for quality experiences with an adult in their life and gain a wider knowledge of the world around them through the magic of books (Justice & Pence, 2005; Scarborough & Dobrich, 1994). It is recognized that advanced language is one of these emergent literacy skills that is learned from book reading and that reading aloud to children is essential for later literacy skill success (Arnold, Lonigan, Whitehurst, & Epstein, 1994; NAEYC/IRA, 1998; Justice & Pence, 2005). The National Early Literacy Panel (2008) analysis names adult-child storybook reading as having significant effects on a preschool child's oral language and print knowledge. It can be concluded that adult-child storybook reading can be used as a catalyst to the world of literacy. Children who are read to often have larger vocabularies, better language skills, and better literacy skills than children who do not have this experience (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Dunst, Williams, Trivette, Simkus, & Hamby, 2012; Justice & Pence, 2005; NAEYC/IRA, 1998; NELP, 2008). Conversely, it could be expected that children who are not often read to may have smaller vocabularies, poorer language skills and lower literacy skill.

Adult-child shared storybook reading is an overall term that has been described as, dialogic reading (Whitehurst et al., 1988), shared storybook reading (Kaderavek & Justice, 2002), and shared reading (Sénéchal & Cornell, 1993). The constant in the intervention is that the storybook is read by an adult. The adult reader can be a parent, teacher, interventionist, or a combination of individuals in these roles. The participant may be an individual child, or small or large group of children in a classroom, child-care or other setting. Adult-child storybook reading refers to any combination of these options. In addition electronic books (e-books) are becoming part of adult-child storybook reading situations (Zucker, Moody, & McKenna, 2009). An e-book refers to book software which can be accessed using a computer. The use of e-books may be a way to increase attention and improve the outcomes of learning vocabulary, especially in children with disabilities for whom attending in school can be difficult (Kaderavek & Justice, 2002).

Whitehurst and colleagues (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Whitehurst et al., 1988) developed the approach known as dialogic reading. Dialogic reading specifically teaches the adult to provide models of language, ask the child questions, and provide the child with feedback. The story is read repeatedly, and adults learn to gradually decrease their involvement as the child becomes the teller of the story. It has been described as an intensive version of the typical parent-child interaction of early storybook reading. Research into dialogic reading, sometimes referred to simply as shared reading, has traditionally focused on the fidelity of the parent training as an integral part of the program (Hargrave & Sénéchal, 2000). Parents are trained with instruction, modeling and feedback sessions. Typically dialogic reading is a parent reading with his/her child. Later studies have examined the children's gain in skills more

closely; although results are usually reported in terms of overall language gains (see Mol, Bus, de Jong, & Smeets, 2008).

Justice and colleagues (Ezell & Justice, 2005; Justice, 2002; Justice & Pence, 2005) use the term shared storybook reading to describe adult-child shared storybook reading. They define these adult-child book reading experiences as reading developmentally appropriate storybooks with a child and an adult. More than simply reading the text, the interaction includes components such as the adult pointing out aspects of book knowledge and print concepts, asking questions, and verbally interacting with the child. Dialogic reading (Whitehurst et al., 1988) also focuses on asking questions and using language stimulation strategies while reading. Justice and colleagues define shared storybook reading as active involvement and engagement during reading and it is based on the fact that learning to read requires explicit instruction. These shared storybook reading methods include using known language stimulation techniques during the reading process. For example, adults use self-talk, parallel talk, expansions, extensions, and asking questions while reading the story together. The researchers note that all areas of a child's language (semantics, phonology, syntax, morphology, and pragmatics) may be addressed through shared storybook reading. In other words, shared storybook reading can have a positive effect in many areas of language. Since the focus of this current study is vocabulary as an important prerequisite for reading, studies discussed below are limited to those focusing on vocabulary acquisition.

Adult-Child Shared Storybook Reading to Learn Vocabulary

Shared storybook reading is an intervention technique recommended for both typical students and students with disabilities to assist in learning vocabulary (Ezell &

Justice, 2005; Johnston, McDonnell, & Hawken, 2008; NAEYC/IRA, 1998). Vocabulary is taught and measured in different ways. Vocabulary can be taught with word elaboration, questioning, multiple readings, and repetition of vocabulary words during adult-child shared storybook reading. It can be measured using standardized tests, vocabulary samples or by testing the specific target words. By helping children with disabilities increase their vocabulary size, the children increase their language skills and therefore increase their base for better reading and academic skills (Ezell & Justice, 2005; Justice & Pence, 2005). These different techniques for teaching vocabulary as part of adult-child shared storybook reading are discussed below.

Adult-Child Shared Storybook Reading with Word Elaboration

Word elaboration is one technique which has been used to teach vocabulary while reading storybooks. Justice, Meier and Walpole (2005) included 57 kindergarten students (5- to 6.5-years-old) who scored low on a phonology awareness literacy screening as participants. The students' mean measurements of expressive and receptive vocabulary on standardized measures were one standard deviation and two standard deviations below normal, respectively. Based on standardized test scores the participants were placed in a relative, researcher identified low- or high-vocabulary group for analysis. The participants were assigned to treatment or comparison group. Children were read books in small group settings (3 to 6 children per group). These groups were chosen for convenience because children were from the same classroom. Education graduate students were the adult interventionists. A total of 10 books were read four times each over the 10 week course of the study, for a total of 20 reading sessions. During reading, the language stimulation technique of elaboration was used as a teaching method.

Elaboration included a scripted explicit definition of the target word following the use of the word in a sentence in the book. Each book had 6 target words; for the treatment group 3 words were elaborated or explicitly defined by the adult reader and 3 were nonelaborated.

The research design was a pretest-posttest comparison group research design. Participants were asked to define the targeted words. A total of 60 words were chosen for the study, 30 of which were used for the elaboration intervention, and 30 of which served as controls. Definitions were scored on a 3 point scale, with 3 points given for complete knowledge, 2 for partial knowledge and zero for no knowledge. Goals of the study were to examine if children learned the target words and whether elaboration had an effect on learning. Raw data showed an average of 3.6 points gain for elaborated words and 3.1 points for nonelaborated words. Overall children learned an average of 6 new words, from both elaborated and nonelaborated word sets. Overall the treatment group showed higher gains compared to the control group. Results of the univariate analysis showed significant main effect for elaborated words (p = .001) and not for nonelaborated words (p = .255). This indicates that while children learned both elaborated and nonelaborated word sets, only the elaborated words showed a statistically significant gain. The use of explicit definitions as a measurement of learning is a more complex measure of vocabulary knowledge (Justice, Meier, & Walpole, 2005; National Early Literacy Panel, 2008). However, the variance of size and participant skills (low- and high-vocabulary groups) in groups is a limitation of this study.

Wasik and Bond (2001) also assessed acquisition of vocabulary words using an elaboration technique with group classroom reading. Four classrooms in a Title I early

learning center, two control rooms and two intervention rooms, were selected for the study. Since the classrooms included morning and afternoon classes, the total number of preschool age (4-year-old) students was 121. A pre- and posttest group design was used. Children were from low-income, at risk families, so they were considered at risk for developing reading difficulties. Two of four teachers were trained as the interventionist; the other two teachers were assigned to the control group. Training included learning to ask open ended questions, defining vocabulary words, and providing opportunities for children to talk and to be heard, typical in adult-child shared storybook routines. The books were read to the whole class as part of the typical class routine. Each classroom was given two books to read each week. The study took place over a 15 week period, 4 of which were used for teacher training. The intervention took place over 11 weeks. Reading occurred in a preschool classroom ratio of one adult to 12-15 children. In addition to the book reading, the teachers were given props and extension activities to use in their classrooms. Specific scripts for defining words were not used.

Receptive vocabulary standard scores were assessed pre- and posttest. Expressive and receptive measurements of target words were assessed only posttest. The authors selected 100 (10 words from each of 10 books) target words, of which 44 were randomly selected for posttesting. Results indicated statistically significant results ($p = <.001$) for the intervention group on the standardized pre- and posttesting, suggesting that overall receptive vocabulary skills had increased. Statistically the intervention classrooms learned more receptive ($p = <.001$) and expressive ($p = <.001$) target words than the control group. The authors theorize that the story props, reading, and extension activities

all contributed to the vocabulary growth. These additions to the reading may have been the reason for standardized score growth due to generalization.

Questioning During Reading

Another technique for vocabulary learning is to ask questions during reading of target words. Sénéchal (1997) investigated the difference in vocabulary acquisition between single-reading, repeated-readings and questioning experiences. Ten preschool age children (3- to 4-years-olds) were assigned to each condition (total of 30 participants). Participants were from middle-class neighborhoods, read to daily, and assumed to have typical development. The examiner and child read in a one on one setting. Children in the single-reading group were read the story one time. The repeated-reading and questioning groups were read the story three times, twice during the first session and once during the second session. The questioning group was asked a what- or where- question after reading one of the 10 target words in the book. The hypothesis was that questioning would be more interactive and produce increased word learning over the other two groups. The answer to the question was to elicit the target word. Target words were synonyms of familiar concepts known to children. For example, if the target word was "angling," the experimenter asked, "What is the person doing?" The participant was expected to answer "angling." The study used a least to most error correction procedure. If the participant said another word or did not know the word, the adult would ask the child to name it what it was called in the book. If they still did not know the answer, the adult would label with the target word. Participants were assessed before intervention with receptive testing of target words and postintervention with expressive and receptive testing with the specific target words. Data on the error correction procedure was not

reported. Posttesting was conducted as part of the reading sessions.

Children in the repeated-reading condition had statistically significant vocabulary gains over children in the single-reading condition. The questioning condition also had statistically significant higher vocabulary gains than the repeated-reading condition (p = <0.001). As predicted, children who labeled words during the story had a higher number of correct answers expressively than any other group (p = <0.001). This study shows questioning during repeated readings leads to better vocabulary gains. Otherwise stated, the more active the child participation during reading, the higher the vocabulary gains. Active participation meant the child was required to verbally participate, instead of passively being read to. However, no standardized testing or other measurements were completed to assess overall vocabulary gains. In an earlier study, Sénéchal and Cornell (1993), examined a single time storybook reading with 4- and 5-year-olds in four conditions: verbatim reading, reading the story as written; word repetition, repeating the sentence that contained the target word; recast, repeating the sentence that contained the target word but using a synonym and questioning, asking what and where questions that required the child to label the target word. The book and vocabulary were the same as the above mentioned study. In all conditions children showed statistically significant (p = <0.01) target vocabulary gains between pre-, post- and delayed testing (1 week later). Children in the questioning condition produced the most target words. However, Sénéchal (1997) stated repeated readings over single reading were more successful for receptive and expressive vocabulary gains. These studies show that active learning requiring a child to use the target word (when the child is required to use the word to answer a question) and repeated readings lead to better receptive and expressive

vocabulary gains. Other studies also combine repeated reading and use of questioning techniques to teach vocabulary. These studies further examine type of questioning.

Questioning Types

Justice (2002), Walsh and Blewitt (2006), and Sénéchal, Thomas, and Monker (1995) examined the role of question type in learning new words for preschoolers during shared storybook reading. The participants in the Justice (2002) study were 23 preschool age children (age 4) with typical development. The interventionist, a speech-language pathologist (SLP), read one on one with the children. One book with 17 target words was read twice over a 1 week period. Ten novel words were chosen individually for each child from the 17 (words the child knew on the pretest were excluded). From the 10 words 5 were assigned to the labeling condition and 5 assigned to a questioning condition. The question type was either perceptual or conceptual based on the group to which the child was randomly assigned. Perceptual questions focused on concrete, salient features such as color, size and shape. Conceptual questions were based on a child's thought or feelings about the target word. Specifically, for the labeling condition task, children were shown the picture in the book of each target word (i.e., "flower") and had the word labeled by the interventionist ("This is a flower"). For the questioning condition task, the target words were used in the scripted question, such as a perceptual question "What color is the flower?" or "Why do you think the flower is so tall?" for a conceptual question.

The Justice (2002) study was a multivariate split plot research design. A Novel Receptive Vocabulary measure and a Novel Expressive Vocabulary measure were developed specifically for the study to assess learning. For expressive measurements,

participants were asked to name the picture on a card with the target word. For receptive measurements, participants were shown four pictures on a test plate and asked to pick the picture of the target word. Receptively there was more word learning for the questioning condition than the labeling condition ($p = .01$). Expressively there was no difference between conditions ($p = .97$). Results comparing question types, perceptual questions versus conceptual questions, showed no advantage in questioning type for either receptive or expressive vocabulary gains. Overall children had minimal learning as measured by the number of words learned for receptive and expressive vocabulary across all conditions, which the author attributed to the short exposure time of only two exposures to the novel words. Although typically developing children learn words quickly (Rice, 1990), it is likely the testing of the study was not direct enough to pick up on the difference or that the two readings were not enough to result in learning.

Walsh and Blewitt (2006) also conducted a study of vocabulary acquisition that had preschoolers (3-year-old) as the participants. Children were administered a standardized receptive vocabulary test, the scores were then used to equalize the initial vocabulary skills across groups. Participants' receptive vocabulary scores ranged between average and 1 standard deviation above average sampling. Children were assigned to one of three groups. The conditions compared were, vocabulary eliciting questions, noneliciting questions and no questions (control group). For the eliciting questions condition, the answer to the question was the target vocabulary word. During noneliciting questions condition, the target vocabulary word was used in the question, but was not part of the answer. Noneliciting questions were similar to the perceptual and conceptual questions used in the Justice (2002) study.

Walsh and Blewitt (2006) chose three story books, with 6 target words each, to be read. Each target word was in two of the three books, for a total of 9 target words. The children met with the interventionist one on one. The interventionist's role was not specified. Participants were read two of three books each session. The books were counter balanced so that children heard all 9 target words twice during each session. Over the 6 week period of the study, the participants were exposed to each target word four times. A pretest and posttest research design was used. The authors developed a New Word Comprehension Test and New Word Production Test of target words for measurement. Raw scores showed receptive gains across all three group conditions, with mean increases of 5.35 for the eliciting group, 4.5 for the noneliciting group, and 1.91 for the control group. ANOVA repeated measures revealed that questioning resulted in statistically significant gains over nonquestioning (p = <0.001). However, no significant difference was found between eliciting or noneliciting questioning types on expressive language gains. Postintervention, expressively children were able to name (give the target word when asked a definition question) a mean of 1 or less than 1 target vocabulary word across conditions. This study suggests that questioning type is not as important as the overall active participation (as defined as verbally answering question) of a child during reading. It is interesting to note that the children made more progress than the previous study (Justice, 2002), which was likely due to the increased length of the study or number of exposures (two exposures versus four exposures). Also both studies had poor expressive language gains, which are expected given the short duration of both studies.

Sénéchal, Thomas, and Monker (1995) also found similar results for author defined active child participation, where children were asked questions or instructed to

point to pictures in the book, versus passive readings, where children were read to but not required to respond. Two experiments were discussed. The first involved 32 children age 4- to 5-years-old. Children had average to high standard scores on a receptive vocabulary test. Participants were assigned one of two book reading conditions. The first condition was called the pointing condition, where after the target words read in the book, the child was asked to point to the picture of the target word in the book. The second condition was called the labeling condition. In this condition the experimenter asked a question that required the participant to answer with the target word. Two books with 13 target words each were used. Target words were synonyms of words known to the children. For example, "fedora," was a target word for "hat." One weakness of the study was that children in the listening and pointing group were exposed to the target word two times each reading, while children in the questioning group were exposed to the target words once. The books were each read once after pretesting and once before posttesting the next day. A third session, called delayed posttesting, was completed 1 week later to assess maintenance. As with the studies mentioned above, the researchers developed their own production and comprehension measures of the target words, with pictures from the book. Comprehension results showed a statistically significant effect (p = <0.2) for children who answered questions over children who listened and pointed during the story. This is to be expected because the practice of saying the word offers a child practice in encoding, associating and storing the word (Sénéchal, Thomas, & Monker, 1995). Production results showed statistically significant results (p = < 0.1) for labeling condition both in the immediate and delayed posttests. Questioning had a bigger effect on comprehension,

but listening and pointing had a bigger effect on production or expressive vocabulary knowledge.

For the second of the two experiments Sénéchal, Thomas, and Monker (1995) had 48 preschool age (4-year-old) participants. The same books were used in this experiment, however, only 10 target words were chosen, with some of the target words varying from the first experiment. Again, target words were synonyms of known words in the stories. Participants were typically developing children who tested average or above average on a standardized receptive vocabulary test. The participants were separated into three group conditions, pointing, labeling or listening. In the pointing condition the examiner asked the child to, "Show me the [target word]." The labeling condition required the child to verbalize the target word in response to a question asked by the examiner. During the listening only condition, the examiner read the book as written but repeated the sentence containing the target word. So in each condition the participant heard the target word twice during a reading. The participants were exposed to the target words four times total over two readings 1 day apart. Pre-, post- and delayed posttesting was completed. Comprehension testing showed statistically significant results ($p = <.05$) for children who were in either the pointing or questioning conditions over the listening condition. However, there was no difference between the two active groups. On the delayed posttest all groups of children maintained the words they had learned, suggesting long term learning had taken place. Expressive testing had similar results, whereas children who were in the active responding condition were able to verbalize more words ($p = <0.05$). Furthermore, children in the labeling condition learned the most words.

Overall, the results of these studies show that children can learn vocabulary from adult-child book reading experiences. Active participation, where a child is required to use the word, point or answer a question, typically produces better results for expressive and receptive vocabulary. Results for tasks which required the participant to use the target word had the best gains. The more children are exposed to the target words, both in the book (through multiple readings) and during classroom extension activities, the more their vocabulary grows. The interventionist, actual books used, and small groups versus one on one reading did not seem to matter for outcomes, as studies all showed some gains in vocabulary. Unfortunately, the error correction procedure or feedback the children received during questioning was rarely included in the study, and it was not part of the analysis. A weakness of all studies was that typical or at risk children, not specifically identified as having a disability, were the participants for the studies. Two of the studies included children who had above average vocabulary skills before the study. Overall, the vocabulary gains for all children were poor to modest. These studies are clearly lacking including children with disabilities who are especially at risk for later reading problems. It is unclear whether these strategies will be effective for children with learning difficulties.

Dialogic Reading

Dialogic reading refers to a type of adult-child shared storybook reading where adults, such as parents or teachers versus an outside interventionist, are explicitly trained to provide increased language and literacy techniques to a child during storybook reading. Many dialogic reading research articles specifically relate to training of the adult and the fidelity of their use of the technique. The target adult, usually a parent, learns to

implement the dialogic reading method, including such components as asking open-ended questions, providing praise and encouragement, following the child's interest, expanding what the child says, and having fun while reading together (Whitehurst et al., 1988). These dialogic reading studies typically examine only overall language and vocabulary development versus specifically measuring novel word acquisition. These dialogic reading studies are introduced as further evidence that questioning and engaging children in adult-child storybook reading help the children make language and vocabulary gains.

Dialogic reading is first described by Whitehurst and colleagues in a 1988 study (Whitehurst et al., 1988) as a parent and child home based intervention. In their study, thirty typically developing children between 21 and 35 months old served as participants and were divided between an experimental and control group. Parents of children in the experimental group participated in two training sessions which provided instruction in altering aspects of child-directed speech during story time, watching examples of dialogic reading and participating in role-playing. The control group was instructed to read as usual to their children. Both groups were instructed to audiotape their reading sessions with their child three or four times a week, over a period of 4 weeks. Pre- and posttesting consisted of three standardized language measures. Mean length of utterance (MLU) was also calculated for the children in each group. Results indicated significant differences for both expressive language measures (p = .0005), but not for the receptive measure for the experimental group on standardized testing (p = .0655). This is in contrast to shared storybook reading using questioning techniques, which showed statistically significant differences in receptive and expressive vocabulary acquisition (Justice, 2002; Sénéchal,

1997; Sénéchal, Thomas, & Monker, 1995; Walsh & Blewitt, 2006). Unlike the shared storybook reading interventions, there are no specific target vocabulary words in dialogic reading so specific vocabulary rate acquisition was not measured. However, gains in MLU were noted in the experimental group, which indicates that expressive language growth was evident in conversational speech. Generalization of vocabulary was not measured as in the previous shared storybook reading studies.

The results of the Whitehurst and colleagues (1988) study were replicated and extended by Arnold and colleagues (1994) when they examined the outcomes of dialogic reading in three conditions. Again mother-child pairs participated in the study. The pairs were divided into a control group, a direct training group, and a video training group. Children ranged in age from 24 months to 35 months, and had average or above average language skills. Pretesting was conducted using standardized tests for expressive language and receptive language. Two training sessions took place over a 4 week period for the direct training and video training groups. During the 4 weeks mothers from all groups reported reading an average of 12 books a week. Posttesting was conducted using a different set of standardized tests than for pretesting. The direct training group outperformed the control group on expressive language measures, but not on measures of receptive language. This is different than the 1988 study which showed differences across both expressive and receptive vocabulary measurements. Interestingly, the effect size of Whitehurst and colleagues (1988) study has not been replicated by any of the subsequent studies on the use of dialogic reading (Mol, Bus, de Jong, & Smeets, 2008). The children of mothers in the video training group performed better than children of mothers in the direct training group with statistically significant results on receptive and expressive

measures. The authors attributed the difference in the group's performance between children's vocabulary skills to the fact that the video training group was shown examples of actual adult-child dyads; whereas direct training used an adult to play the role of a child, which was less real to life. They also mentioned that using a standardized video tape may provide more consistent training, which could have led to the better outcomes for the video training group children. Again this study shows that changes in adult input during stories can produce language gains in young children.

Hargrave and Sénéchal (2000) compared typical reading and dialogic reading technique in combined childcare and home settings. The 36 study participants (ages 3 to 5) were considered to have delays in vocabulary including 1 child who had been diagnosed with a learning disability. The participants were divided into an experimental group (dialogic reading group) and control group. The hypothesis was that the dialogic condition would produce better gains in vocabulary because it presents more active child participation than typical shared reading. In the dialogic group parents, typically the mother, and the childcare teachers were trained by watching videos from previously mentioned study (Arnold, et. al, 1994). To more accurately reflect typical childcare settings, books were read to eight students by one teacher and read as part of the usual daily routine. Unlike the previously mentioned dialogic reading studies, in addition to overall vocabulary measurements, the researchers had specific vocabulary words targeted. Pretesting consisted of standardized receptive and expressive vocabulary measures as well as an expressive test of the new vocabulary words. At school, 10 books were read twice over the 4 week period of the study. At home, 18 book titles were available from the center. Parents were asked to read four books. Results show no

statistically significant difference between pre- and posttest standardized receptive vocabulary testing for either treatment or control group. Children in the childcare dialogic reading group did score significantly higher ($p = < .03$) on the expressive vocabulary test and naming pictures of the novel target words. Comparisons were difficult between the home groups because of a limited number of selected participants and limited treatment compliance. These results are interesting because typically receptive vocabulary is thought to proceed expressive. Unfortunately, the target vocabulary words were not examined receptively in this study.

Blom-Hoffman and colleagues (Blom-Hoffman, O'Neill-Pirozzi, Volpe, Cutting & Bissinger, 2006) also examined dialogic reading with parents and their children using videotaped trainings, which were produced in collaboration with Whitehurst. Eighteen parent-child dyads were chosen as participants. Children ranged in age from 3- to 4-years-old. Pre-, 6 week post- and 12 week postmeasurements were taken. Similar to the previous studies, this study showed that parents could learn to use the dialogical reading facilitating verbalization technique following video training. Children's on-task language was measured for the control and treatment group. The children in the dialogical reading technique experienced a large gain in on-task to the book verbalizations over the control group (ES = .78). In the postfollow-up, both children in the dialogical reading group continued to show positive verbalization gains. The usefulness of a community based training, in this case in children's health center waiting rooms, was also addressed in this study.

Huebner (2006) also assessed training conducted in person by library personnel in an urban library setting. Children, age 2-to 3-years-old, and their parents served as

participants. The treatment group received two, 1 hour group training sessions in dialogical reading. The control group received two sessions of typical library services consisting of story and craft time. Typical to previous studies, children with obvious developmental delays were excluded from the study. Gains in children's standardized test scores were seen in expressive and receptive measurements in posttesting and follow-up testing. However, only one measurement of expressive language was statistically significant (p = <0.1). Larger expressive language gains had also been found in the previous dialogical reading studies. In summary, dialogical reading studies show that differences in adult reading styles can lead to a child's gain in overall vocabulary skills as evident in standardized testing.

Adult-Child Shared Storybook Reading Summary

Mol and colleagues (2008) completed a meta-analysis on adult-child storybook reading. Inclusion criteria for the studies included adult child dyads where the adult was a parent (school/teacher studies were excluded) and the child was between the ages of 2 to 6. All child participants were at risk for academic delays or typically developing. Any studies including children with disabilities were explicitly excluded. From the analysis, the authors concluded that quality and frequency of book reading were important for producing positive language outcomes. Adult-child reading also appears to have more of an effect the younger the age of the participating child. The earlier a child receives the intervention the better the outcomes. The effect of vocabulary growth was larger for expressive vocabulary than receptive. This could be expected because the goal of shared storybook reading, especially dialogic reading, is to increase the child's active participation in the reading experience. Children who had higher SES families, and

therefore were considered less at-risk, made better gains in vocabulary than children who were at-risk. They also found that the quality of the intervention was as important as the number of times books are read. Therefore, the most effective techniques for enhancing vocabulary should be carefully constructed in a clear intervention package for the best possible vocabulary acquisition results.

From the shared storybook reading and dialogical reading studies it is obvious that typical and at-risk preschool age children can make gains in vocabulary from adult-child storybook reading interventions. Significant results appeared in studies of one-on-one reading (Hargrave & Sénéchal, 2000; Justice, 2002; Sénéchal, 1997; Sénéchal & Cornell, 1993; Sénéchal, Thomas, & Monker, 1995; Walsh & Blewitt, 2006; Whitehurst et al., 1994; Whitehurst et al., 1988) and in reading to groups of children (Justice, Meier, & Walpole, 2005; Wasik & Bond, 2001). Regardless of the duration of the intervention and number of times the book was read, all studies discussed above showed some positive results, however, longer interventions produced better results. A question type which required active participation, and eliciting of the target vocabulary word, seemed to produce the most significant results (Justice, 2002; Sénéchal, 1997; Sénéchal & Cornell, 1993; Sénéchal, Thomas, & Monker, 1995; Walsh & Blewitt, 2006; Wasik & Bond, 2001).

Although these studies often included at risk children, there are no known studies of adult-child shared book reading interventions resulting in language and vocabulary gains in children diagnosed with a disability. One reason for this is that it can be difficult to achieve homogeneous groups for pre- and posttest designs when participants are children with disabilities. Since children with disabilities are most at risk and knowledge

of appropriate evidence based interventions is recommended, this is a significant gap in the research. However, using a single subject design (Horner, Carr, Halle, McGee, Odom & Wolery, 2005; Kazdin, 1982) may be a way to examine the effects of adult-child storybook reading in children with disabilities.

Vocabulary and Technology

Technology, specifically computer software programs, is another way children may be exposed to and learn new vocabulary words. Use of visual aids, including e-books has been recommended to increase learning and understanding in children with and without disabilities (Johnston, McDonnell, & Hawken, 2008; Zucker, Moody, & McKenna, 2009). Assistive technology, which includes e-books, is required to be considered while writing an IEP (Individuals with Disabilities Education Improvement Act IDEA, 2004). In addition, national and state organizations have recommended the use of various technologies in early childhood classrooms (Division of Early Childhood (DEC), 2007; Education & Life, 2005; National Association for the Education of Young Children (NAEYC), 1996; NAEYC, 2012). Specifically, The National Reading Panel (2008) suggests using technology as a method for increasing vocabulary and that increased vocabulary can lead to better reading outcomes. Zucker, Moody and McKenna (2009) state that for children with reading disabilities, e-books may be considered as a method of assistive technology.

E-books are software accessed on a computer and include a computerized version of the book's pictures, printed words, and a read aloud option (simply a computerized text-to-speech or recorded narration). Many e-books include additional features such as defining words, animation or video, music and games. E-books may be similar to a

traditional hard copy book (e.g., an e-book based on The Cat in the Hat (Seuss, 1957)) or a novel story theme. The e-book software is on a closed system; it is not on open, networked systems such as the internet (Zucker, Moody, & McKenna, 2009). Overall, children's e-books are similar to traditional books in that they have a narrative theme, pages that need to be turned, and pictures which illustrate the story.

Moore and Calvert (2000) studied technology assisted vocabulary learning in children, age 3 to 6, who were diagnosed with autism. This is one of the few studies directly targeting students with disabilities and measuring attention and motivation. Treatment conditions included a teacher directed labeling drill and a similar drill performed on a computer. The computer software program added features such as color, animation, music and interesting sounds. In addition to vocabulary learned, the authors measured attention and motivation of each treatment condition based on a student's on-task behavior and willingness to complete the task. The results were that children had better attention and learned more words with use of the computer software. Like the previously mentioned study, an obvious flaw to this study is a lack of a control group. However, the results lead to the possibility of using computer software as a means for teaching vocabulary for students with disabilities.

De Jong and Bus (2002) did not examine vocabulary directly, instead measuring emergent reading, word recognition, letter naming, rhyming, name writing and word writing between a traditional book and an e-book. The study had 48 participants, age 4-6, who were from a town in the Netherlands. The children were divided equally into four groups: regular book group, computer book group (restricted), computer book group (unrestricted), and control group. There were six training sessions over 2 1/2 weeks for

all groups except the control. Children on the computer were given a set amount of time to explore the program. The restricted group was not allowed to access the games in the program and usually completed the entire book during their computer time. Children in the unrestricted group spent most of their time playing games and accessed only two pages of the electronic book on average. Emergent reading was measured using a story retell task. The groups performed better on the story retell task with the format they had been exposed to during training sessions. This could indicate repetition of reading and familiarity with format led to better language gains or prepared them better for end of intervention assessment but might not have a long term effect on overall language gains.

Verhallen, Bus, and de Jong (2006) examined the difference between using multimedia e-books (with sound, animation, etc.) and static e-books in kindergarten children learning Dutch as a second language. This study was conducted in the Netherlands. Children were assigned to one of six groups: multiple (four) readings of multimedia e-book, multiple (four) readings of static e-book, one reading of multimedia e-book, one reading of static e-book or a control group. Vocabulary was tested by showing the child a picture of the target word from the story and asking the student to complete a sentence. For example, a picture of a cat sleeping on the floor was shown and the sentence, "The cat is sleeping on the …" was given. Other pre- and posttest measurements of story retelling and syntax were also taken. Children who used the multimedia e-book multiple times were the only group who made statistically significant gains in vocabulary knowledge.

Across all studies on e-book or technology assisted reading, very little interaction occurred between the researcher and the children. As with the studies of vocabulary

learning from traditional books, these studies only included typically developing children or at-risk children. Overall studies of e-books are difficult to compare for two reasons, the rapidly changing technology from year to year, and the differing variety of features between e-books (de Jong & Bus, 2002; Korat & Sharmir, 2007; Zucker, Moody, & McKenna, 2009).

Purpose of Current Study

It is clear there is a lack of research on children with disabilities learning vocabulary from adult-child storybook reading, especially when using technology or e-books. This study examined an intervention package created to address these needs, combining shared storybook reading to increase vocabulary and effective instructional strategies for children with disabilities. The intervention package or independent variable used in the study was known as Vocabulary Learning through Books (VLTB). Each child was read books in both a typical adult-child storybook reading and an adult-child e-book reading task. All reading was conducted in a one-to-one adult child ratio to provide fewer distractions and individualized attention to the child. As with previous adult-child shared storybook reading, children were asked questions while reading, praised for attending and responding, and read the same book repeatedly (Arnold et al., 1994; Whitehurst et al., 1988). While reading the book, after reading the target word, the interventionist asked a question which contained an elaboration (definition) of the word and required the child to answer by repeating the target word (Justice & Ezell, 2002; Mol et al., 2008; Sénéchal et al., 1995; Walsh & Blewitt, 2006). Least to most prompting strategy was used for instruction. Specifically the VLTB intervention package included: 1. Reading a book or e-book in an adult-child book reading activity; 2. after a target vocabulary word is read,

the child was asked a question requiring them to answer using the target word; 3. least to most prompting was used to provide the child assistance as needed to the correct response; and 4. verbal reinforcement, "You're right," and an expansion sentence, "[target word] means [definition]."

This proposed study sought to examine the treatment effects of using shared storybook reading and using an e-book to teach vocabulary to children with disabilities. The previous studies have shown that typical and at-risk children can learn vocabulary from adult-child shared storybook reading. The most effective strategies included multiple readings (Justice, Meier, & Walpole, 2005; Sénéchal, 1997; Wasik & Bond, 2001), elaborations (Justice, Meier, & Walpole, 2005) and active participation of the child (Justice, 2002; Sénéchal & Cornell, 1993; Sénéchal, 1997; Sénéchal, Thomas, & Monker, 1995; Walsh & Blewitt, 2006; Wasik & Bond, 2001) during reading. In addition, e-books have been shown as a possible means to teach vocabulary to at-risk children (de Jong & Bus, 2002; Verhallen, Bus, & de Jong, 2006) and those with disabilities (Moore & Calvert, 2000).

Effective intervention for children, especially children with disabilities, includes having joint attention or being actively engaged in the learning task, and motivating the child to participate in the instruction or learning opportunity. Effective practices also teach that learning should occur in a naturally occurring activity (DEC, 2007) such as teaching vocabulary in the context of storybook reading. The previously mentioned studies predominately used an error correction type intervention strategy for pointing and questioning procedures. For example, a child was asked to point to the pictures of a "llama." If the child had an error or no response, the adult would verbally prompt and

model to the child to point to the correct target such as, “This is the llama, point to the llama.” Using a hierarchy of antecedent prompts or the least to most intrusive prompting strategy may be a more appropriate way for children with disabilities to learn new vocabulary (Bailey & Wolery, 1992). Least to most prompting is similar to scaffolding techniques discussed by Justice and Pence (2005), where learning is built on knowledge already demonstrated by the child. Since this study purposed to teach vocabulary across multiple readings, a least to most prompting strategy provided independent learning across multiple opportunities.

Social validity refers to the social importance and acceptance of the treatment and outcomes of the goals (Fuqua & Schwade, 1986). In simple terms, social validity answers the following questions: Did the intervention package make the desired change in the participant’s behavior? Was the change significant? And, was it an acceptable intervention practice for to the participants and interventionists? Typically social validity is measured with an assessment regarding specific aspects of the intervention package and outcomes given to the interventionist, participants, if applicable, and others secondary to the study, such as teachers, parents or other familiar with the participant. None of the previously conducted studies examined the social validity of the adult-child story book reading intervention. Social validity is an important aspect when working with children with disabilities because the ultimate goal of the study is to provide information to teachers and others working with these students. Measuring social validity is a more subjective way to measure the success of the intervention based on personal feedback. For these reasons a social validity checklist was developed and used for this study.

There are four phases of learning: acquisition, fluency, maintenance and generalization. Generalization is the transfer of skills outside of the set learning conditions and an important phase of the learning process (DEC, 2007). True learning can be said to have taken place when a child can take an acquired skill and apply that knowledge to new areas and situations. Generalization is also an aspect of social validity. It can measure the extent to which the desired behavior was changed or learned. This study measured the extent to which the target vocabulary was learned by measuring generalization across the time and task (Beck, McKeown, & Kucan, 2002). The target words were continued to be monitored after the word was learned, and then target vocabulary, receptive and expressive, was measured for use outside the learning situation. While some studies cited in this review of literature used a delayed measurement to examine maintenance (Sénéchal & Cornell, 1993; Sénéchal et al., 1995), no generalization measurements were administered. Generalization to overall vocabulary skill was measured with standardized testing in some studies, however, the specific target words were not assessed for generalization. Because generalization is an important aspect when evaluating learning, this purposed study included measurements for generalization.

In summary the VLTB intervention package incorporates, adult-child book reading, questioning during reading requiring the child to answer with a target word, and least to most prompting with verbal reinforcement for required answer. Research questions were designed to examine the effectiveness of intervention during acquisition, comparison of e-books and traditional books, and the social validity of the VLTB intervention and generalization of learning outcomes. Specifically, the research questions for the study are:

1. Can children with disabilities increase their vocabulary through an adult-child shared book reading interaction incorporating the VLTB intervention package?

2. Is there a difference in vocabulary learning in children with disabilities between a traditional shared book reading activity versus e-book shared book reading activity, when taught with the same intervention package?

3. What is the social validity of the vocabulary teaching instructional package for both the traditional shared book reading activity versus e-book shared book reading activity?

4. Can the participating children with disabilities generalize learned vocabulary to other objects and situations in the classroom setting?

CHAPTER 2

METHODS

Participants

Six preschool age children, between the ages of 54-64 months (average 59.8), who received preschool special educations services were selected as participants for this study. However, Diego's participation was discontinued after 4 weeks due to continued refusal to interact with the interventionist. Children had an active IEP and were classified as having a Developmental Delay (DD) according to Utah State Office of Education (USOE) rules and regulations (USOE, 2007). The Peabody Picture Vocabulary Test III (PPVT-III) (Dunn & Dunn, 1997) and Expressive Vocabulary Test (EVT) (Williams, 1997) were administered. All children communicated by speaking in sentences but had overall language delays. Receptive language scores on standardized language testing were 1 or more standard deviations below the norm for the child's age. Expressive language scores were 1 or more standard deviations below the norm for their age for 3 of the 6 children (Jared, Tolani, and Diego). The remaining 3 children scored within the typical range for receptive language skills. Additional qualifiers for the participants included having normal vision and hearing as demonstrated by passing school screenings, being able to participate in one on one learning scenarios with an adult (e.g., sufficient attention span), and having good school attendance. English Language Learners (ELL) were not excluded provided they had adequate English skills. This was demonstrated by

meeting the above criteria, such as speaking English in sentences to communicate at school and scoring 1 or more standard deviations below the norm for their age on the PPVT-III and EVT as administered in English.

University institutional review board and district research approval were obtained prior to study implementation. The participants were selected from a large metropolitan school district preschool program, which provides a full continuum of services for children who attend Title I, and tuition based classes. General education teachers, speech-language pathologists (SLPs), and special education consultants were contacted to nominate children who met the above criteria as possible participants. Parents of possible participants were then contacted. Parents were informed of the study and given consent forms. Information was translated by a trained school district translator for parents who did not speak English.

Demographic information was collected on the participants through the use of a survey completed by the child's parent and teacher. Information included the child's age, years of preschool, disability category, typical reading habits (i.e., frequency, favorite books), and home language (Appendix A). The results of the demographic information surveys and preliminary testing are presented in Table 1. Other information about specific participations include that Nick was diagnosed with a seizure disorder and had recently had a change in medication. However, at the time of the study, his medication and seizures were under control. Benji's school classification was DD but he also had characteristics of a child on the autism spectrum, including echolalic speech.

Setting

The study, including preliminary testing, baseline, intervention phase I, intervention phase II, maintenance and generalization, was conducted in the participant's preschool classroom located in an elementary school. All participants were enrolled in inclusive preschool classrooms. The intervention was conducted by the study administrator, a Ph.D. candidate in special education who is a speech-language pathologist with experience working in preschool classrooms with children with disabilities. Book reading occurred during one on one sessions with the interventionist and child in a comfortable place within the classroom. For Nick, the reading location was moved to outside of the classroom, in a comfortable seating area. This was due to the child being frequently distracted by the classroom and schedule of the classroom. This participant was allowed to invite a friend from class to join the book reading session. Before the reading, the friend was instructed, by the interventionist, to answer only the questions directly asked to them. The interventionist then asked the friend an alternative question during book reading.

Materials

The books *Sunny Farm* (Apple Tree App, 2010) and *Owen* (Henkes, 1993) were used in the study. The e-book *Sunny Farm* (Apple Tree App, 2010) is specifically produced as an app for the iPad and is not available as a traditional book. An Apple iPad2 was used to present the book *Sunny Farm* in its electronic format, known as an e-book. The iPad2 is equipped with Wi-Fi, 16 GB storage, and 9.7 inch LED backlight display. The book *Owen* (Henkes, 1993) was presented in a traditional hard bound copy. Three target vocabulary words and 3 nontarget words were selected for each book. The target

words for *Sunny Farm* were *mucky, stable,* and *sneaked*. The target words for *Owen* were *handkerchief, stuffed* and *ratty*. The nontarget words for *Sunny Farm* were *stroke, reporter,* and *grubby.* The nontarget words for *Owen* were *plunger, twisted,* and *essential*. Each group of words included a noun, verb, and adjective.

Words selected for both books met the criteria used by Justice and colleagues (2005) specifically that: (a) the word is likely unknown to preschool children, (b) the word appears only one time in the text with little or no explanation of the word in the narrative, and (c) the word meets Beck's (Beck, McKeown, & Kucan, 2002) criteria for a "tier two" word. Tier one words are basic words (e.g., dog, clock, walk), tier two words are words considered high frequency words in advanced vocabulary (e.g., infant, enormous, abscond), and tier three words are low frequency and often domain specific (e.g., schematic, granulomas, monoblock). Beck et al. suggests targeting tier two words from a variety of word types for instruction because gains on these words can make the highest impact on expanding a child's vocabulary.

The books were chosen based on criteria for teaching vocabulary from previous vocabulary storybook studies (Elley, 1989; Hargrave & Senchal, 2000; Justice, Meier & Walpole, 2005). The criterion includes an age appropriate book likely unfamiliar to the children, an appealing story with attractive illustrations and vocabulary words likely unknown to preschool children contained in the narrative of the story. Prior to the study, all parents reported that their child was not familiar with either of the books included in this study. The e-book *Sunny Farm* was selected because it was specifically produced for an electronic format (as an iPad app). The electronic format included having an option to turn off narration, allowing manual page turning, and having hotspot features which

provide further interaction by providing bonus narrative text and animal sounds. In addition, the books were chosen as a pair because they are similar in length and complexity. *Sunny Farm* is the equivalent of 24 pages with an average of 12 words per page in the text, with more words within the hotspot features. *Owen* is 22 pages with an average of 21 words per page. Illustrations are similar in each book. Both books contain full color, full page, and realistic illustrations.

Lexile measurement is an equation based on a text's semantic and syntactic features (MetaMetrics, 2013). Semantics ease or difficulty depends on word frequency and is measured by the number of syllables and number of letters in a word. The theory is that the less frequent a word, the more difficult it is to comprehend. Syntactic difficulty is measured by sentence length and based on the idea that longer sentences are more difficult to comprehend (Stenner, 1996). Thus, the Lexile measurement gives a number of relative ease or difficulty of a given text. The lower the number the easier the text is to comprehend. The book *Owen* (Henkes, 1993) was given a Lexile measurement of 370. The e-book *Sunny Farm* (Apple Tree App, 2010) was given a Lexile measurement of 380. This indicates these books are similar in complexity and should have similar overall comprehension rates.

Experimental Procedures

Dependent Variable

The dependent variable of this study was the number of target words correctly identified and defined. The target words were used to determine vocabulary growth. These were assessed by weekly probes. Probes were conducted after the last treatment day of the week. Target words and nontarget words were probed weekly. Probes

consisted of an expressive measurement where the child was asked to define the word and a receptive measurement where the child was asked to select the picture of the word named from a field of 4. The expressive measurement probe was completed first, followed by the receptive measurement probe. For the expressive measure, children were asked simply, "What does [target word] mean?" The definition was scored as completely correct or incorrect for a total possible score of 3 correct target words per book. Definitions were used because a word is considered to be well known when a child is able to define it (Beck, McKeown & Kucan, 2002).

The receptive measure used four pictures that were actual pictures from the book, with 1 correct and 3 foils selected from a pool of 18 pictures per book. The pictures were on 4 by 6 cards inserted into a plastic four pocket page protector presented in a 3-ring binder. On each page, the child was asked, "Point to [target word]." The cards were presented in a randomized arrangement with the placement of the target words and foils varied during each weekly probe according to the randomization schedule. Again the score was determined out of a possible 3 correct target words per book. The same procedure for measuring expressive and receptive words scores for nontarget words occurred concurrently. An error analysis log was also recorded. The error log included type of error, such as which picture was chosen, whether it was correct or incorrect, and other information about the session, such as subjective information about the child's attention.

Independent Variable

The independent variable for this study is the Vocabulary Learning through Books (VLTB) intervention package that was used for teaching vocabulary during

reading of an e-book and traditional book. Specifically the VLTB intervention package includes:

1. Reading *Sunny Farm* (e-book) or *Owen* (traditional book) (Henkes, 1993). Both books were read in a counterbalanced order during each session.

2. After the sentence containing the target vocabulary word was read, the child was asked a question including the definition requiring them to answer using the target word (e.g., "What word means sticky, slimy mud?")

3. Either least to most prompting (Intervention Phase I) or simultaneous prompting (Intervention Phase II; Bailey & Wolery, 1992) was used to assist the child in obtaining the correct answer. Intervention Phase I prompting consisted of asking the question again, giving the answer, then asking the question again. If the child's answer was still incorrect, the question was asked again, the answer given, and the child asked to repeat the word. Intervention Phase II prompting consisted of first asking the questions before the story was read. When reading, asking the question again, giving the answer simultaneously, and then continuing to read the story.

4. Verbal reinforcement, "Right, [target word] means [definition]," was provided when the child provided the correct answer during any prompting step during Intervention Phase I or during the instructional session of Intervention Phase II. If the child's answer was incorrect, no response was given and the reading (Intervention Phase I) or instructional prompts (Intervention Phase II) was continued.

Design

Single subject research methods are experimental designs used to show causal or functional relationships between the independent and dependent variables (Horner, et al., 2005; Kazdin, 1982; O'Neill, McDonnell, Billingsley, & Jenson, 2011). A single subject research Adapted Alternating Treatment Design (AATD) was used for this study. This design allows for comparison of multiple interventions concurrently, making it ideal for simultaneous presentation of interventions. The two simultaneous interventions for this study were the traditional book and e-book. AATD design can be used to compare the effectiveness and efficiency of different interventions on new (nonreversible) behaviors. Effectiveness and efficiency of an intervention is determined by which intervention produces more change in the dependent variable, the intervention that first reaches a stable performance level, and/or which intervention data points are outside the range of data points for the other intervention being examined. A weakness of the AATD, and all research, is not having strict control over internal validity. However, the AATD design naturally controls for participant maturation by rapidly alternating interventions and by beginning both interventions at the same time, across participants. In this study a procedural elements script was used to control vocabulary exposure across interventions. Procedural fidelity and interobserver agreement (IOA) was completed to assure control over internal validity. Nontarget words were used as an additional control for the independent variable by controlling for exposure to words versus the Vocabulary Learning through Books (VLTB) intervention package. The two interventions for this study were, e-book and traditional book reading, and both interventions were completed

during the same session. The order of the interventions was counter balanced between days and weeks, so that each intervention session was started with a different book.

Study Procedure

Baseline Phase

Baseline phase consisted of expressive and receptive measurement of target and nontarget words in both books. The interventionist conducted all baseline testing. Each student was pulled aside to a quiet space in the classroom for baseline measurement. Testing began with the interventionist introducing herself. First the student was asked to define the target and nontarget words, to assess expressive vocabulary knowledge. The same procedure for weekly probes was used during baseline. The student was asked, "What does [word] mean?" Words were scored as either correct (score of 1) or incorrect (score of 0). For receptive testing, the same pictures used during the weekly probes were used to probe target and nontarget words. The pictures were presented in the same manner as weekly probes, with 4 pictures on a page, 1 correct and 3 foils. Receptively the words were scored as either correct (score of 1) or incorrect (score of 0). Baseline was conducted daily until stable performance was established and a minimum of three consecutive daily sessions had occurred. Once baseline was complete, intervention began the following day. All participants began baseline simultaneously as is typical with the AATD.

Intervention Phase I

Intervention sessions occurred four days a week during the child's typical school day. Participants were read both a traditional book and an e-book during each session.

The procedural script was as follows. First, the interventionist introduced herself to the child and asked the child to join her to read the books. Second, the first book for the day was read. The books were read according to counterbalanced order. The text was read as written; questions were asked after reading the sentence containing the target. The interventionist pointed to the picture of the target word while the question was asked. Gestures were used for illustrating the definition of the target word. For example, the word "sneaked" was accompanied by putting the index finger to the mouth in the "shhh" gesture. The questions for target vocabulary words were: "What word means a small cloth you use to wipe your face?" (handkerchief); "What word means to push something quickly into a small place?" (stuffed); "What word means it is old and falling apart?" (ratty); "What word means a building that horses are cared for and live in?" (stable); "What word means sticky, slimy mud?" (mucky); "What word means to move quietly and not be seen?" (sneaked). During reading, interruptions were minimized by reading written text and following the VLTB intervention procedure. While reading the e-book *Sunny Farm*, the child was allowed to access hotspots, marked with a speaker icon, as the participant wanted after the entire page was read. If a target word was on the page, access to the hotspots was withheld until the VLTB intervention procedure was finished. Appendix A shows the VLTB interventionist procedural script and reinforcement procedure. After 2 weeks of daily sessions, a tangible reinforcer was also provided. This was a small edible or sticker. See Appendix B for daily implementation data sheets.

The least to most correction procedure was implemented as a prompting strategy and each level of prompt was scored. After the child did not answer or answered the question incorrectly, the interventionist asked the question again, then gave the answer

with the definition, and asked the question again. For example, “What word means a small cloth you use to wipe your face? Handkerchief means a small cloth used to wipe your face. What word means a small cloth you use to wipe your face?” If child answered correctly verbal praise was given (“Right, [target word] means [definition].”), and the reading continued. If the answer was incorrect, the interventionist asked the question again, gave a one word answer, and then asked the child to repeat the answer. For example, “What word means a small cloth you use to wipe your face? Handkerchief. Say ‘Handkerchief.’” After the child repeated the word, verbal praise was given (“Right, [target word] means [definition].”). If the child did not answer when asked to repeat the target word, they were again prompted to say the correct word. Whether or not they said the target word, feedback was given. The feedback was the target word and definition, without the verbal praise. For example, “Handkerchief means a small cloth used to wipe your face.” A scale of 0-4 was used to score the least to most prompting strategies. A score of 4 was for a correct response, 3 for prompted response, 2 for repeated response, 1 for a repeated response after a second repeat from the interventionist, and 0 for no repeated response or refusal.

Intervention Phase II

If a child did not make progress, simultaneous prompting was started as an alternative prompting strategy. Not making progress was defined as not meeting criteria for daily probes over 10 weeks and by having at least 3 consecutive daily implementation data days of 3 or less correct (out of 6). The simultaneous prompting intervention was implemented similar to phase I except for changes to the prompting. The questions and target words were the same for both prompting procedures. Simultaneous prompting

implementation consisted of: 1. Before reading the books, the target words were probed. The interventionist asked the question containing the target word (e.g., "What word means sticky, slimy mud?"). Target words were presented in random order. Specific praise was given for correct answers. Incorrect answers were ignored. 2. The interventionist read *Sunny Farm* (e-book) or *Owen* (Henkes, 1993). Again both books were read each session. 3. After the sentence containing the target vocabulary word was read, the child was asked a question including the definition requiring them to answer using the target word (e.g., "What word means sticky, slimy mud?") 4. Immediately after asking the question, the interventionist answered the question (e.g., "Mucky"). 5. If the child repeated the answer following the prompt, the interventionist gave verbal praise "Right, mucky means sticky, slimy mud." If the child did not answer, or answered incorrectly, the interventionist ignored the incorrect response and continued reading. Appendix C includes the instruction sheet for simultaneous prompting and Appendix D includes the simultaneous daily implementation data sheet. A correct or incorrect score was given for prompt and instruction probes in the simultaneous prompt procedure.

Maintenance

A child met criteria for mastery after four consecutive sessions of correct responses for all target words with either least to most (Intervention Phase I) or simultaneous prompting (Intervention Phase II). Once a participant had mastered the daily probes, the VLTB intervention package was conducted only once a week as a maintenance measurement. The same prompt procedure that the student met mastery with was used during maintenance, to assess what level of prompt was needed to recall

information. However, children were only given credit for a correct response when they provided an unprompted answer.

Weekly Probes

Weekly probes of target and nontarget vocabulary words were conducted for receptive and expressive changes using the same technique listed in the baseline section. Weekly probes were conducted at the end of the week, usually the fourth day, and before the intervention or maintenance session was conducted. Expressive probes involved asking the participant the definition of the target and nontarget words. Receptive probes involved asking the participant to point to a picture representing the target word out of a field of 4. Appendix E includes a copy of the probe for weekly data sheets. The criterion for mastery was 100% correct target words on both expressive and receptive weekly testing twice, nonconsecutively.

Generalization

Once a student had met criteria for the daily probes a generalization phase began. The generalization phase included adding probes conducted with different pictures illustrating the target words for receptive measurement. For the receptive measure, pictures were either printed from the Boardmaker software program (Mayer-Johnson, 2006) or actual photograph images found through Google image searches, when Boardmaker did not have an easily identified picture. The pictures were presented in the same manner as the receptive measurements. A target picture and 3 foils were presented on a page. The child was to point to the picture of the target word. Once a student had

met criteria on weekly probes, a person other than the interventionist would perform the weekly probes.

Social Validity

Finally, at the conclusion of the study, a survey was used to assess social validity of the VLTB intervention procedures by classroom teachers and assistants (Appendix F). The social validity survey included questions about the perceptions of children's overall change in vocabulary and language skills. In addition it asked teachers if they thought the VLTB procedure would be something they could implement in their classroom.

Procedural Fidelity and Interobserver Agreement

Procedural fidelity and interobserver agreement (IOA) was collected during a minimum of 25% of the daily intervention probe sessions (range between 25% and 39% per child) and 50% of the weekly probes (range between 71% and 100% per child) by an additional research colleague trained by the study administrator. Procedural fidelity and IOA data collection sheet for the weekly probes is included in Appendix G. Appendix H and I contain the procedural fidelity and IOA data collection sheets for Intervention Phases I and II, respectively. Both procedural fidelity and IOA agreement was targeted for 90% or greater accuracy across all study phases. For daily intervention probes, including maintenance if applicable, procedural fidelity ranged from 99% to 100%, with an average of 99.8% and IOA ranged from 98% to 100%, with an average of 99.3%. Weekly probe procedural fidelity ranged from 99% to 100% per participant, with an average of 99.7% and IOA ranged from 98% to 99% per participant, with an average of 98.8%. Procedural fidelity and IOA was calculated by point by point agreement on each

item being measured. For example, each probe was assessed for 1) asking the question correctly, 2) providing feedback correctly, and 3) scoring the participants response correctly.

Table 1. Participant Demographic Information

Participant	Age (years: months)	Home Language	PPVT-III Standard Score	EVT Standard Score	Years of Preschool	Frequency of Home Reading	Child familiar with e-books	Literacy Goal on IEP
Nick	58	English	82	96	2	Daily	No	Yes
Benji	61	English	71	89	2	1x week	Yes	No
Jared	64	English	62	73	3	Daily	Yes	No
Jose	54	English	78	88	1	Daily	No	No
Tolani	60	English	76	73	1	<1x week	Yes	No
Diego	62	Spanish	40	40	1	Daily	No	Yes

Note. PPVT-III, Peabody Picture Vocabulary Test 3rd Edition. EVT, Expressive Vocabulary Test.

CHAPTER 3

RESULTS

Of the 5 children who completed the study, 3 met the established criteria for daily implementation data. The criterion consisted of four consecutive sessions of 100% correct independent responses. Two children (Benji and Jose) were successful in meeting this criterion during least to most prompting Intervention Phase I. One child (Nick) was successful in meeting the daily implementation criteria when switched to the simultaneous prompting procedure Intervention Phase II. The school year ended before Tolani or Jared could meet criteria with either Intervention Phase I or II. In addition, Tolani had an extended absence of 3 weeks during a family move. None of the 5 children met criteria for the weekly receptive and expressive probes. The criteria for weekly probes were 100% correct (6 out of 6) on expressive and receptive probes for three nonconsecutive sessions. All 5 children were able to receptively identify target words during weekly probes. Two children (Benji and Jared) were able to define some target words.

Daily Probes

During the reading sessions, the children's responses were recorded. A response was considered correct when unprompted. See Figures 1 through 5 for results of daily probes. For each daily probe the child was asked, "What word means [definition of target

word]?" during the shared storybook reading session. The child was expected to state the target word. The type of prompting was dependent on which phase of the intervention the child was in.

Jose (Figure 1) was the first to meet criteria and did so during Intervention Phase I. He named the 3 target words in the traditional book after 10 sessions. By 17 sessions, he was consistently naming the target words in both the e-book and the traditional book. He met criteria at 26 sessions. Jose's daily implementation data shows better efficiency and accuracy for learning the traditional book first. In addition, he was able to maintain the target words of the traditional book more accurately than the target words of the e-book.

Benji (Figure 2) was second to meet criteria and did so during Intervention Phase I. Similar to Jose, Benji was more successful learning the target words of the traditional book first. The number of correct target words on the e-book remained level at 0, he was unable to name any target words, for the first 27 sessions. The number of correct target words for the traditional book was 0 until session 11. After session 11, Benji named target words in the traditional book for 27 sessions before he began naming any of the e-book target words. Until he met criteria, he was more accurate naming target words of the traditional books. By session 42, Benji had meet criteria for daily probes. He was able to maintain all 6 target words.

Nick (Figure 3) met criteria at 47 sessions and named the 3 target words in the e-book first but there was not a consistent trend between types of book. Nick was the third to meet criteria. He had difficulty attending to the intervention task and frequently needed redirection to attend. Nick did not correctly name any target words in either book for 23

intervention days. At this point Nick began Intervention Phase II. The simultaneous prompting procedure quickly produced a change in number correct. During the first session of Intervention Phase II, he was able to name 1 target word of the e-book. Both the e-book and the traditional book had similar variable growth patterns, with no clear preference of book. After meeting criteria, he maintained the 6 target words during the two sessions of the maintenance phase.

Tolani and Jared did not meet criteria before the end of the year. Jared (Figure 4) demonstrated an obvious trend of more correct answers for the traditional book over the e-book. Only once did he correctly answer all 3 target words for the e-book. During eight sessions, he correctly answered all 3 target words for the traditional book. Jared was able to answer some target words correctly during Intervention Phase I, but never met criteria. Intervention Phase II had a slow growth trajectory, but still variable performance between sessions, before the study ended because the school year was over.

Tolani (Figure 5) only once was able to name the target words of either book during phase I. After 27 sessions, Tolani was switched to Intervention Phase II. After six daily intervention sessions of Intervention Phase II he was answering the target words correctly. He was slightly more accurate naming the e-book target words. Tolani had difficulty attending to the task and also moved during the study, which caused him to miss 3 weeks (11 probe sessions). The trajectory of his responses indicates that he was increasing correct identification of the number of target words during the last four sessions.

Three children (Jose, Benji, and Nick) met criteria and began maintenance. Benji and Nick maintained the 100% criteria for the remainder of the study. Jose maintained

the 100% criteria for traditional books, but decreased to 2 out of 3 on 50% of maintenance probes.

The first research question of this study was, can children with disabilities increase their vocabulary through an adult-child shared book reading interaction using a traditional adult-child book reading activity, incorporating the VLTB intervention package? Results of the daily implementation data indicate that the VLTB intervention package was successful in teaching children to name the target vocabulary words when provided with the definition. Although only 3 (Jose, Benji and Nick) of the 5 children met criteria, all were successful in learning some new vocabulary words.

The second research question of this study was, is there a difference in vocabulary learning in children with disabilities between a traditional shared book reading activity versus e-book shared book reading activity, when taught with the same intervention package? Three (Benji, Jose, Jared) children displayed a faster rate of learning for the traditional books. One student (Nick) displayed a faster rate of learning for the e-book. One student (Tolani) did not display a performance difference based on type of book. The results of the daily implementation data do not show a consistent replication of results across participants that would have indicated whether the traditional book or the e-book was more effective for teaching vocabulary.

Weekly Probes

Target versus Nontarget Words

Weekly probes were conducted to more conclusively determine word learning. The daily implementation data probes required the child to say the target word when given the definition, a skill explicitly taught by the intervention. Weekly probes were

conducted to assess receptive and expressive learning of target and nontarget words. Receptive weekly probes required the child to identify the target word by pointing to a picture from a field of 4 pictures which were illustrations from the story. For receptive weekly probes, the child was asked, "Point to [word]?" Expressive weekly probes required the child to provide the definition of the word, by asking, "What does [word] mean?" Figures 6 through 10 show the results of the 5 participant's weekly probes organized by target and nontarget words. Results did not follow a predictable pattern, and varied across weeks and participants. Receptively, the number of correct target words for probes were higher than nontarget words across participants. The criterion for completion was to correctly identify the 6 target words over 3 nonconsecutive sessions. Benji was able to meet criterion on receptive probes. Nick identified the 6 target words once, on the last day of the study.

Expressively, three children (Tolani, Jose, Nick) were unable to define any target words during the weekly probes. Jared defined the target word "stuffed" on three probes. Benji defined 5 target words on two occasions. He defined target words with 32% accuracy (23/72) during the probes. None of the children were able to define nontarget words during weekly probes. After only a few sessions, the children began to reply, "I don't know," instead of trying to answer the question. Five weeks after baseline, a presession practice prompt was added to try to help children actively answer questions. The prompt consisted of 3 practice questions. The 3 questions were to define the words, enormous (really big), chair (something you sit on), and wash (clean with soap and water). The children were asked to define the practice word, if they were unable, the definition was given and the question was asked again. Whether or not they answered the

questions correctly, the target and nontarget words were then probed. No children defined target words, until this prompt was added.

The first research question of this study was, can children with disabilities increase their vocabulary through an adult-child shared book reading interaction, incorporating the VLTB intervention package? Even though only 1 child met receptive probe criteria, the VLTB intervention package was successful in teaching the children the target words as evidenced by daily implementation data and weekly receptive probes. Expressively, only 2 children were able to define any target words. However, no child was able to define nontarget words. Repeated readings, without the VLTB procedure, did not result in the children learning the definitions of words. The VLTB procedure was able to receptively teach identification of target words, although to criteria for only 1 child. There was also minor success in teaching definitions of target vocabulary words using the VLTB procedure.

Traditional Book versus e-Book

Figures 11 through 15 show the results of the 5 participant's weekly probes organized by traditional book versus e-book, between receptive and expressive probes. Benji and Jared clearly demonstrated a learning advantage for the traditional book including a faster rate of learning and more accuracy. These children also made the fastest progress during the daily probes. Nick had more total correct target words on the traditional book (18/39) than the e-book (15/39), with a slight advantage for traditional book in rate of acquisition. Tolani demonstrated slightly more correct answers for the e-book (6 versus 5 out of 24 possible). There was no clear difference in rate of acquisition. Tolani did not meet criteria for daily probes. Jose first had an acquisition advantage for

the e-book for number correct and rate of acquisition, but after 3 weeks, the e-book receptive words dropped and the traditional book resulted in a higher rate of accuracy. The traditional book was the only book for which he was able to receptively answer all 3 target words.

The second research question of this study was, is there a difference in vocabulary learning in children with disabilities between a traditional shared book reading activity versus e-book shared book reading activity, when taught with the same intervention package? Results of the traditional book versus the e-book weekly probes do not show a clear advantage for either book type. Two children (Benji and Jared) displayed a faster rate of learning as evidenced by more correct answers for the traditional book. Two children (Nick and Jose) overall displayed more correct answers for the traditional book, but based on the rate of acquisition it was difficult to determine an advantage. Tolani, had no clear advantage for either type of book. Based on the weekly probes, there is a slight advantage for learning vocabulary from the traditional book over the e-book.

One research question directly addressed generalization. The question was, can the participating children with disabilities generalize learned vocabulary to other objects and situations in the classroom setting? Once a child met criteria for daily intervention, a generalization phase was added to the receptive weekly probe. The probe consisted of using a different set of pictures for the receptive weekly probe. Once a child met criteria for the weekly expressive probes, a generalization phase involving a different person asking the probes was planned. However, no child met criteria on expressive probes. Generalization is shown in the weekly probes Figures 1 and 2. The children demonstrated a slightly higher accuracy for learning the nontarget words during generalization.

Error Type

The expressive weekly probe errors consisted predominately of the child saying, "I don't know," shrugging their shoulders, giving no response or giving random answers. This occurred in 869 instances of 958 errors or 90% of the time. Immediately repeating the question or word occurred in 12.3% (118/958) of errors. Rarely (7 times, less than 1%) was the error because the child gave only a partially correct definition. Errors of receptive weekly probes fell into three categories. The most common error type (476/681, 70%) was guessing or apparently aimless picture pointing. This included patterns such as choosing a mix of items on the top and bottom of the left side of each page or only choosing the pictures on the right and left bottom on the page. The second error type was choosing the picture in the same position on each page (170/681, 25%), such as always choosing the picture on the top, right. The least frequent type of error for receptive probes was refusal, or no response (35/681, 5%).

Pattern of Words Learned

Daily Implementation Data

According to daily implementation data, the word "stuffed" was the easiest to learn. Two children (Jared and Jose) learned the word "stuffed" first. Benji learned "ratty" first, but "stuffed" was correct on the next session. "Ratty" was learned second by Jose and Jared. Nick did not consistently name words until Intervention Phase II, and then named the words in the e-book in the order of "stable," "mucky" then "sneaked." After Intervention Phase II, Tolani was somewhat consistent in learning "stable," but did not learn any other words. So on the traditional book the order of the types of word was

verb, adjective, then noun. The order of word type learning on the e-book was noun, adjective and then verb.

Weekly Probes

Five of the 6 target words were identified more often than the nontarget words. The target word "mucky" from the e-book was identified less frequently than the 3 nontarget words from the traditional book. The target word, "stuffed," from the traditional book was the most frequently correct word on the receptive weekly probes. That is, the children were able to identify the picture of the word "stuffed" the most across weekly probes. This implies that "stuffed" was the easiest word to receptively learn.

For expressive weekly probes, children were asked, "What does [word] mean?" Jared was able to define "stuffed" three times. Benji was able to define all 6 target words. He named "handkerchief" seven times, "stuffed" and "mucky" five times, "ratty" three times, "stable" two times, and "sneaked" once. Since no other children were able to define the words, there is no replication of this pattern of word growth. No children defined nontarget words.

Social Validity

This study also assessed the social validity of the VLTB package. The research question was, what is the social validity of the vocabulary teaching instructional package for both the traditional shared book reading activity versus e-book shared book reading activity? Five questionnaires were presented to the teacher and assistant teams in the classrooms where the studies were conducted.

The questions and results are presented in Table 2. The questionnaire was 5 questions presented on a 5 point scale. Overall the social validity results were moderately positive as to ease of implementation, and change in the child's target vocabulary and overall vocabulary. The staff also noted the VLTB package was a moderate interruption to the classroom routine and a moderately valid method to teach vocabulary. Two staff wrote optional comments on their questionnaire. The first comment was, "The child became more verbal and focused throughout the day on the days he attended VLTB regularly." The second comment was, "It helped him to focus on his work more and in large groups at circle time."

Table 2. Teacher/Assistant Social Validity Questionnaire

Question	Mean	SD
To what extend did the VLTB intervention package produce change in the child's overall vocabulary? (1 = no change, 5 = large change)	3.25	0.4
To what extend did the VLTB intervention package produce change in knowledge of the child's target vocabulary? (1 = no change, 5 = large change)	3.4	0.5
To what extent was the VLTB intervention package easy to implement in the classroom setting? (1 = very difficult, 5 = very easy)	3.4	0.8
To what extent was the VLTB intervention package an interruption of the typical classroom routine? (1 = no interruption, 5 = much interruption)	2.6	0.8
To what extent is the VLTB intervention package a valid method to teach vocabulary? (1 = not valid method, 5 = very valid method)	3.6	0.8

Note. All items were on a 5 point scale. $n = 5$

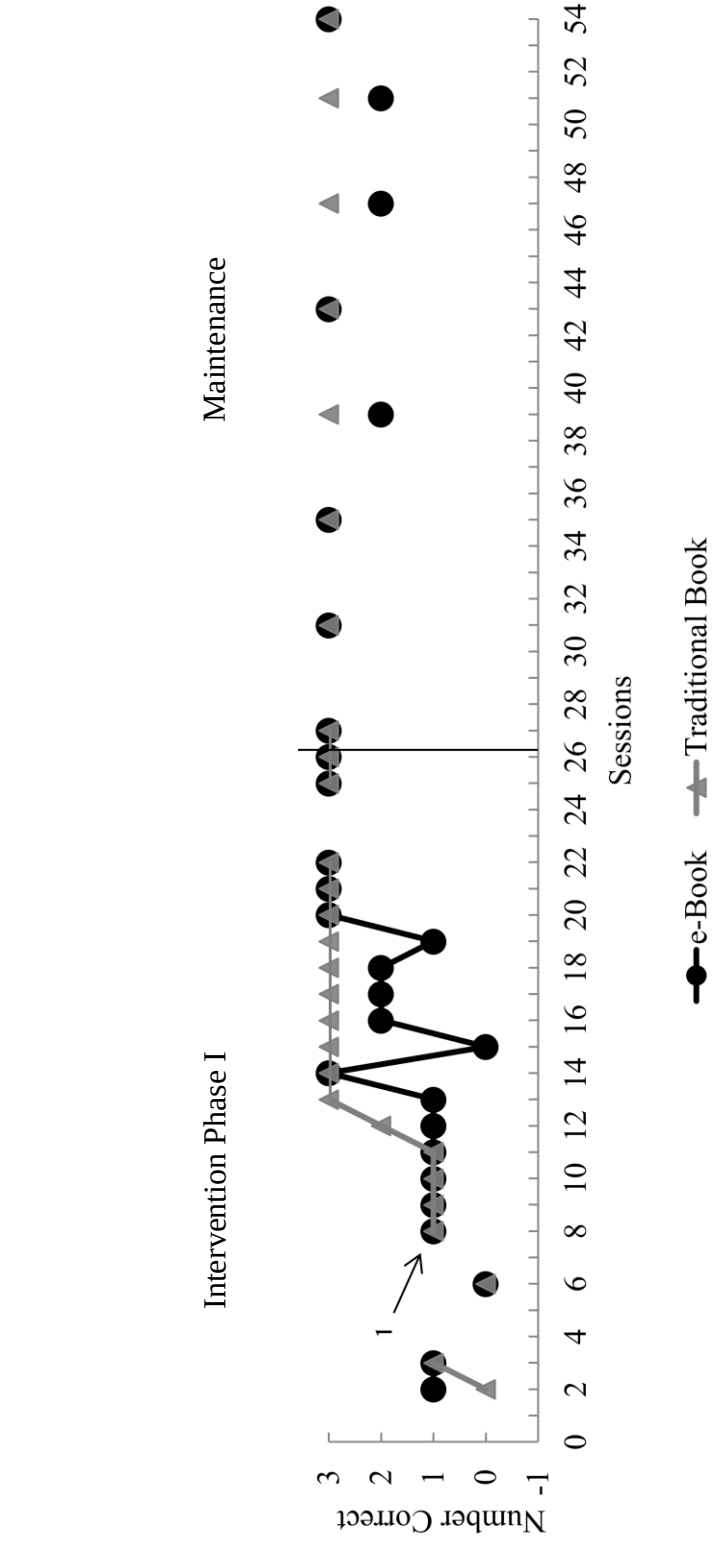

Figure 1. Jose's Daily Intervention Data
Note. Arrow number 1 is start of tangible reinforcers.

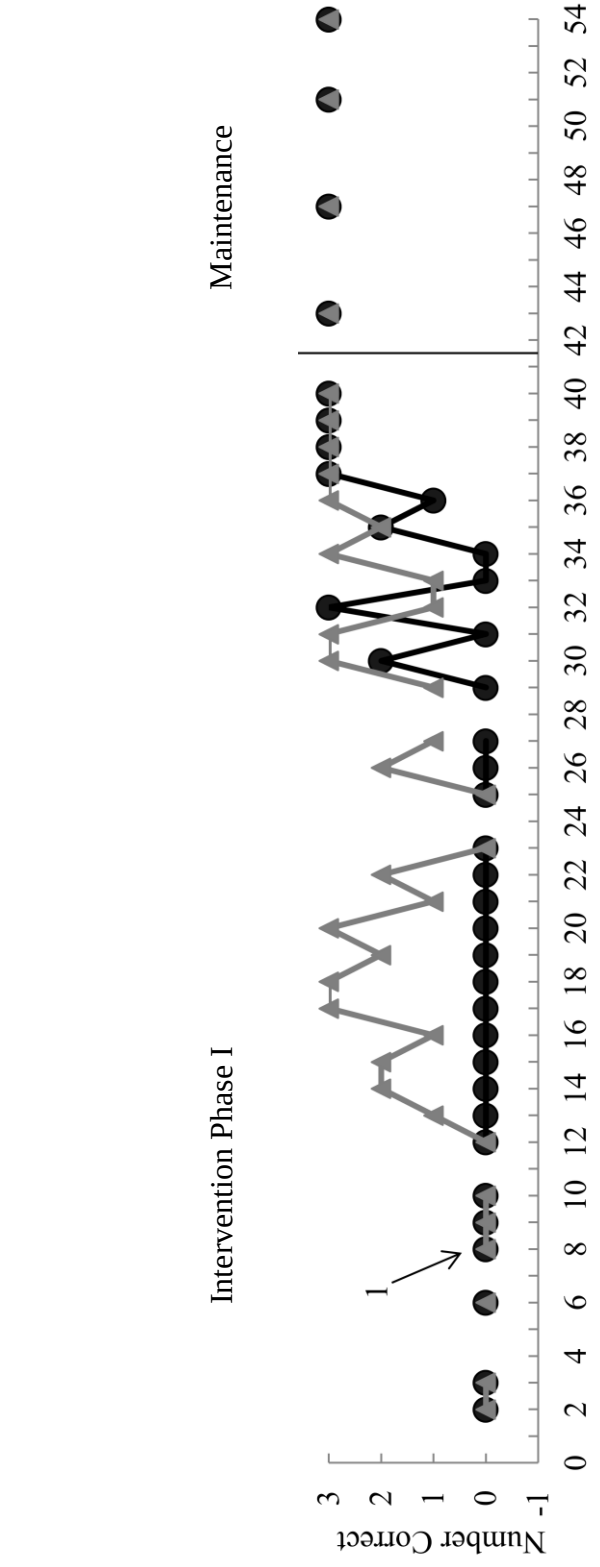

Figure 2. Benji's Daily Intervention Data
Note. Arrow number 1 is the start of tangible reinforcers.

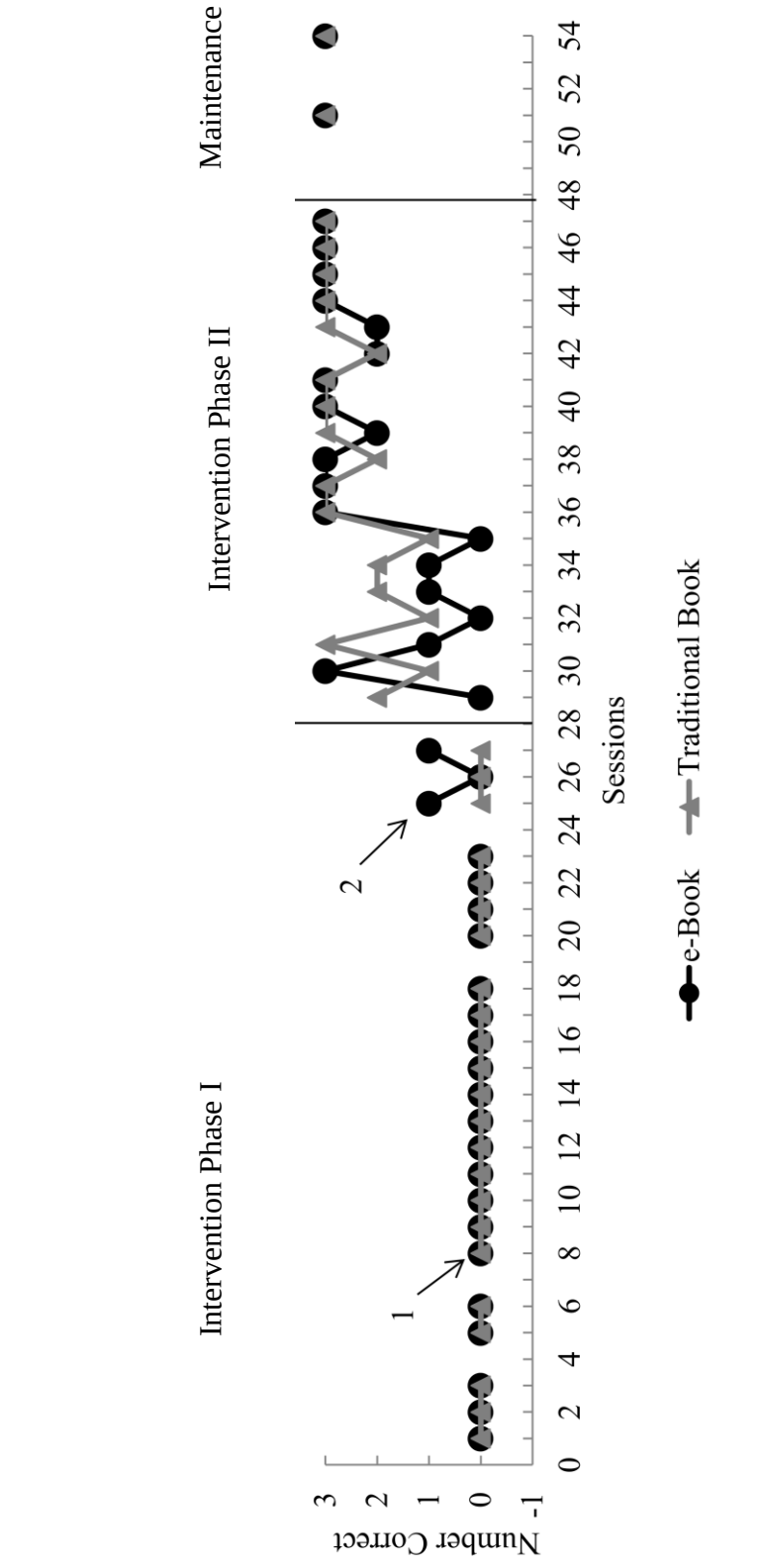

Figure 3. Nick's Daily Intervention Data
Note. Arrow number 1 is the start of tangible reinforcers. Arrow number 2 is the start of intervention sessions in setting outside of classroom.

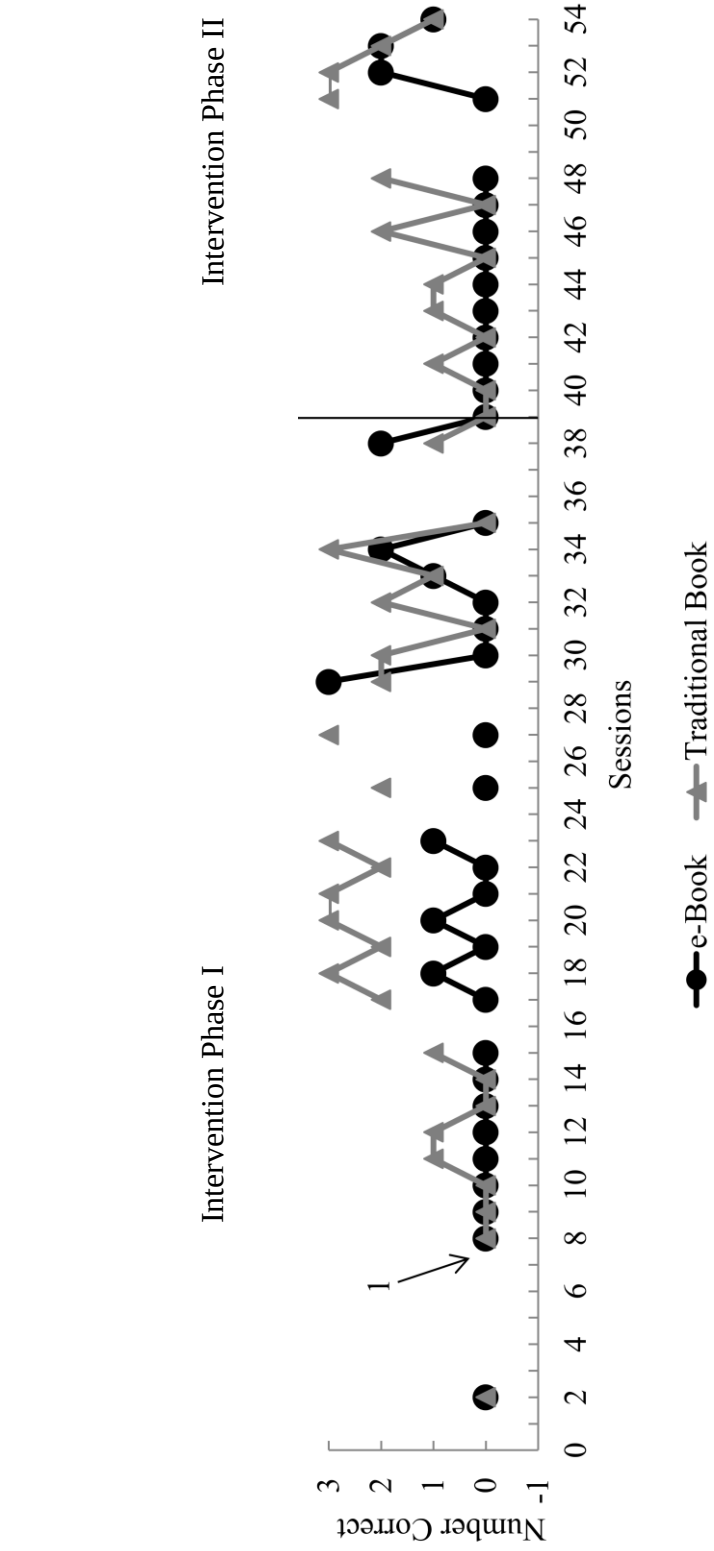

Figure 4. Jared's Daily Intervention Data
Note. Arrow number 1 is the start of tangible reinforcers.

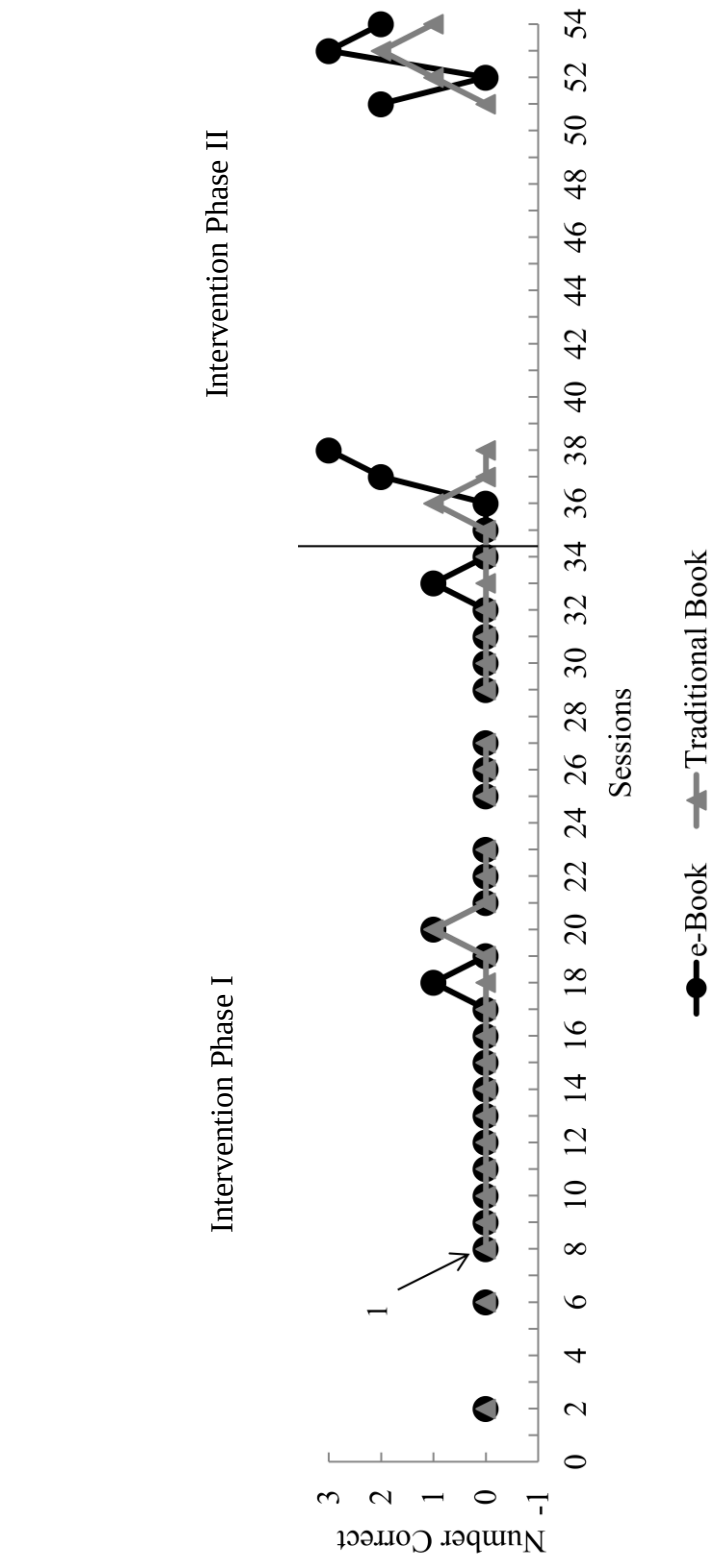

Figure 5. Tolani's Daily Intervention Data
Note. Arrow number 1 is the start of tangible reinforcer.

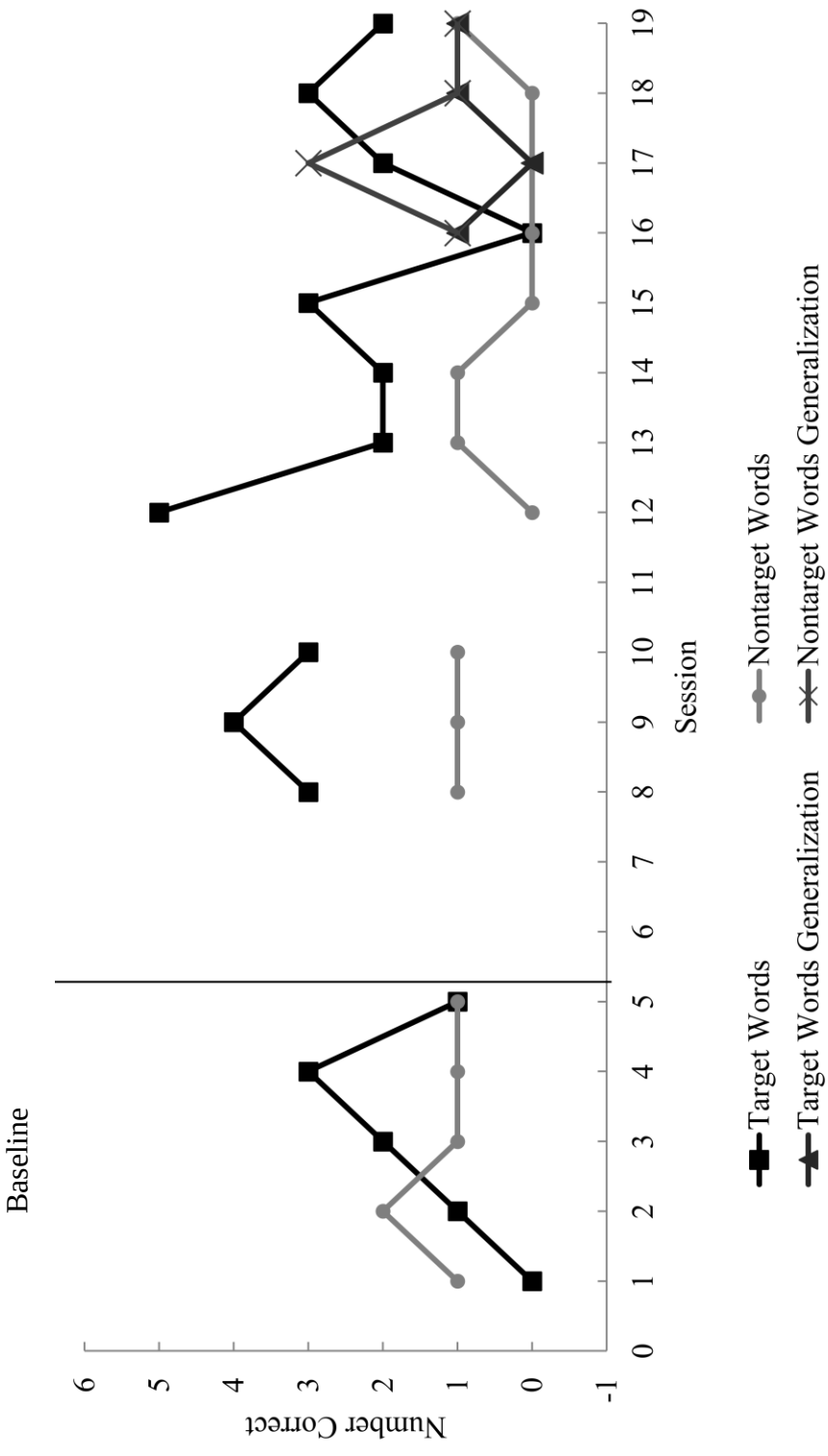

Figure 6. Jose's Weekly Receptive Probes, Target versus Nontarget

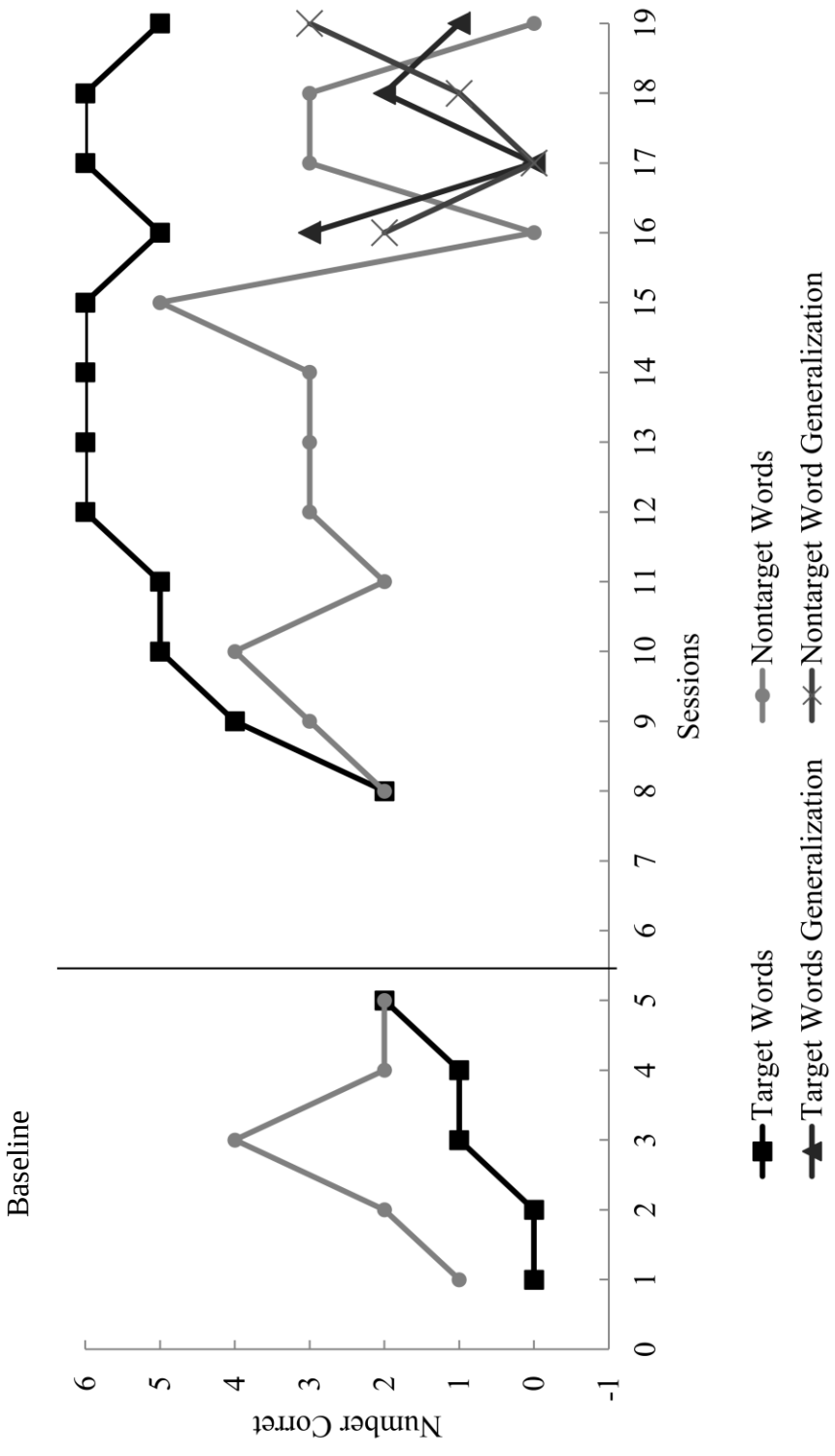

Figure 7. Benji's Weekly Receptive Probes, Target versus Nontarget

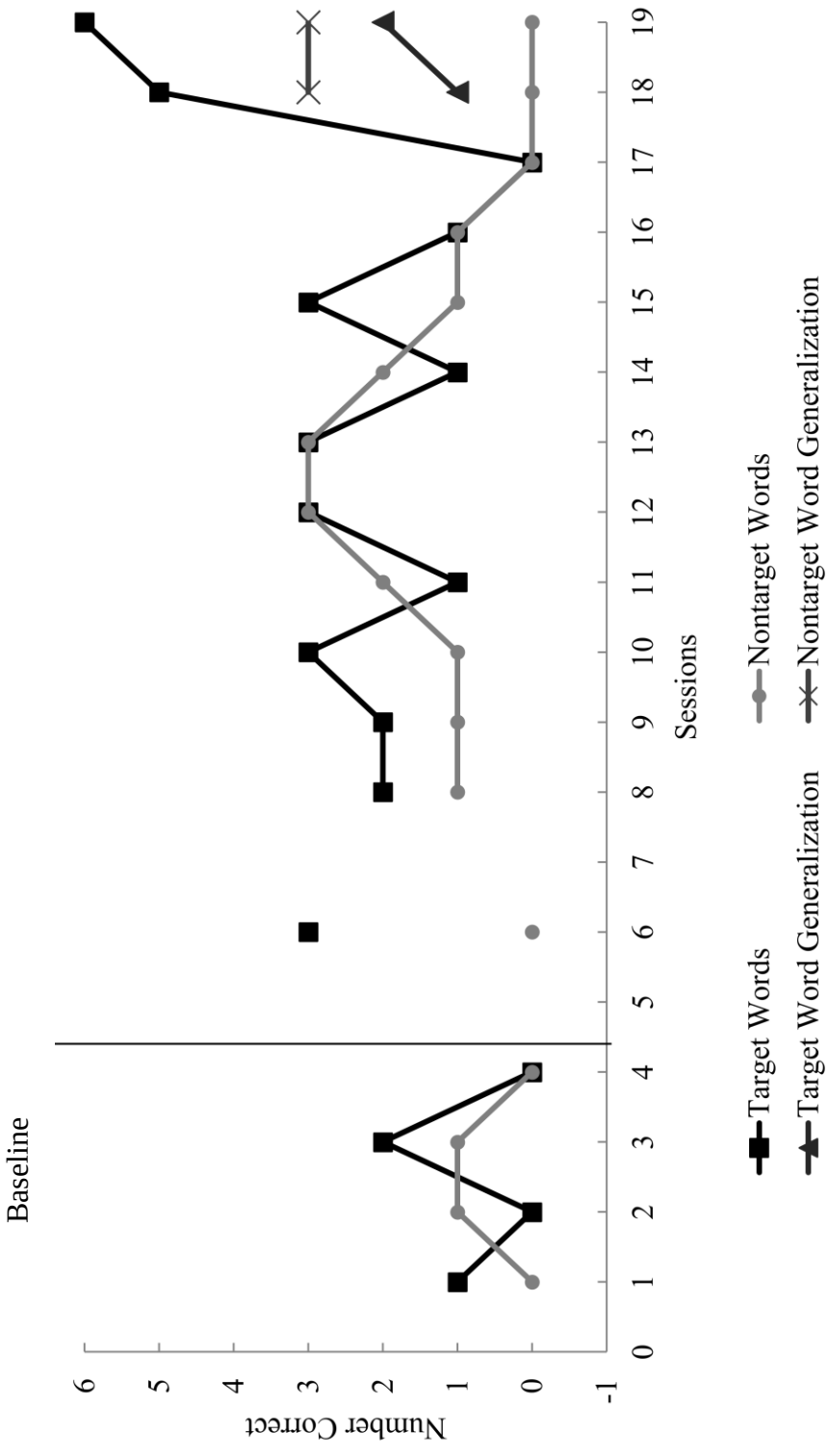

Figure 8. Nick's Weekly Receptive Probes, Target versus Nontarget

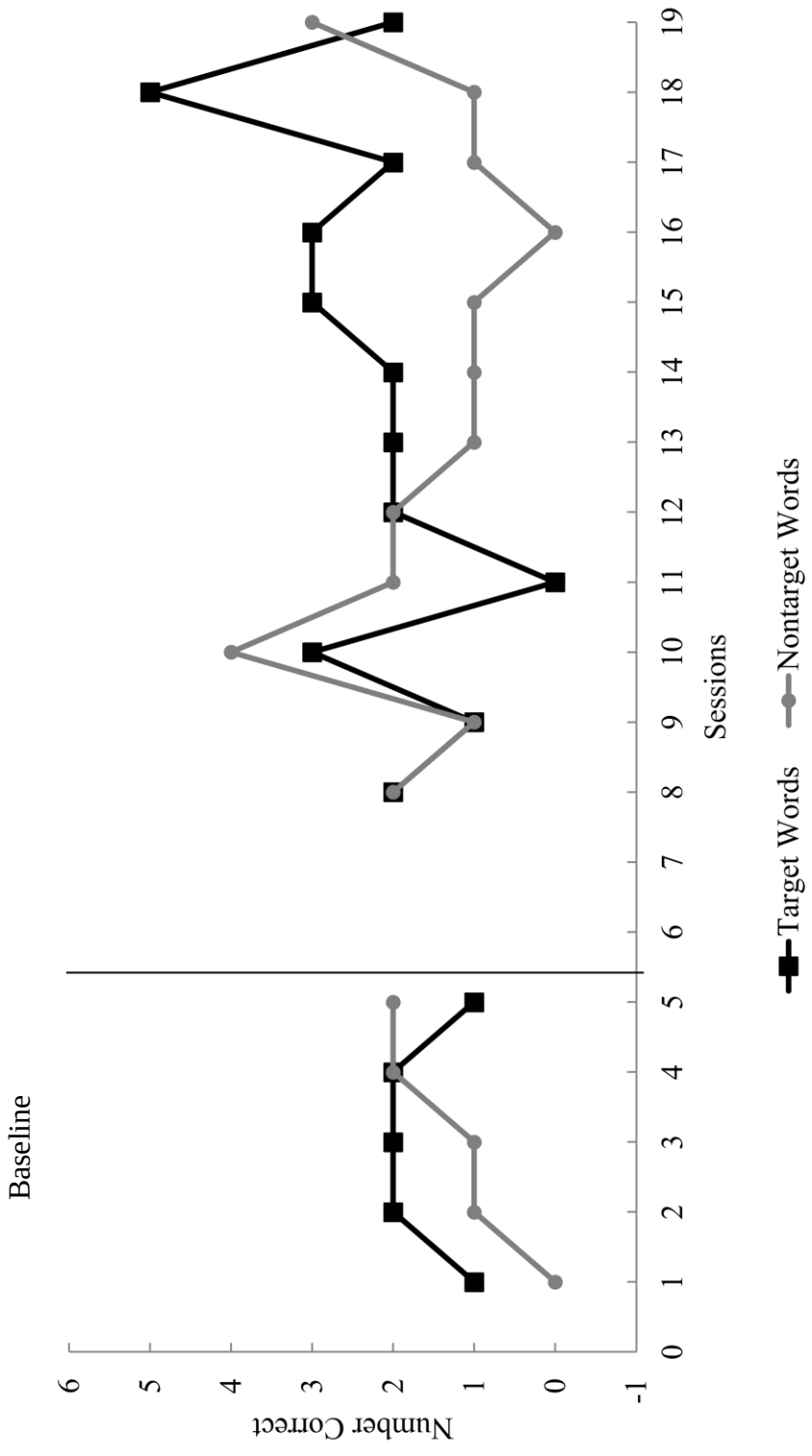

Figure 9. Jared's Weekly Receptive Probes, Target versus Nontarget

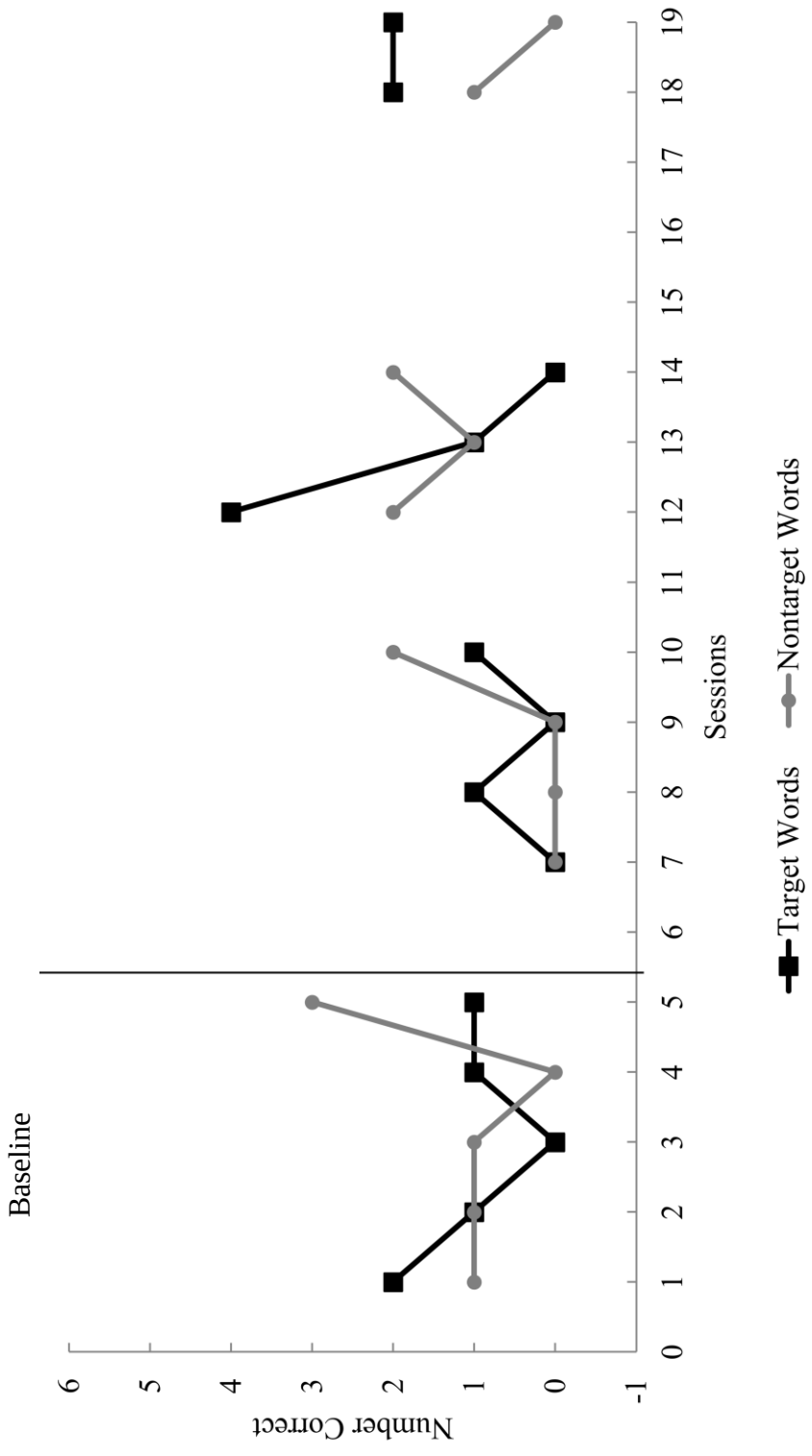

Figure 10. Tolani's Weekly Receptive Probes, Target versus Nontarget

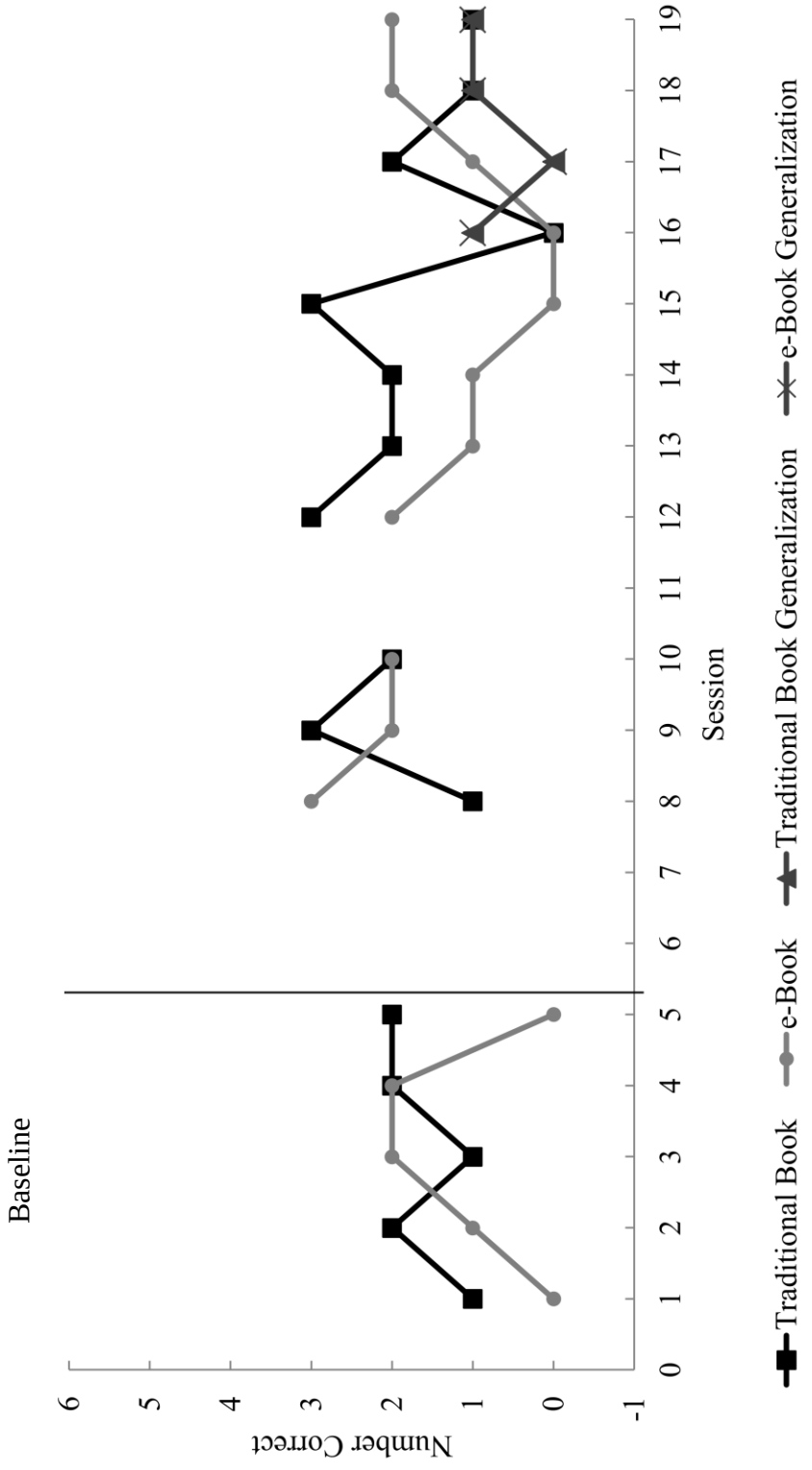

Figure 12. Jose's Weekly Receptive Probes, Book Types

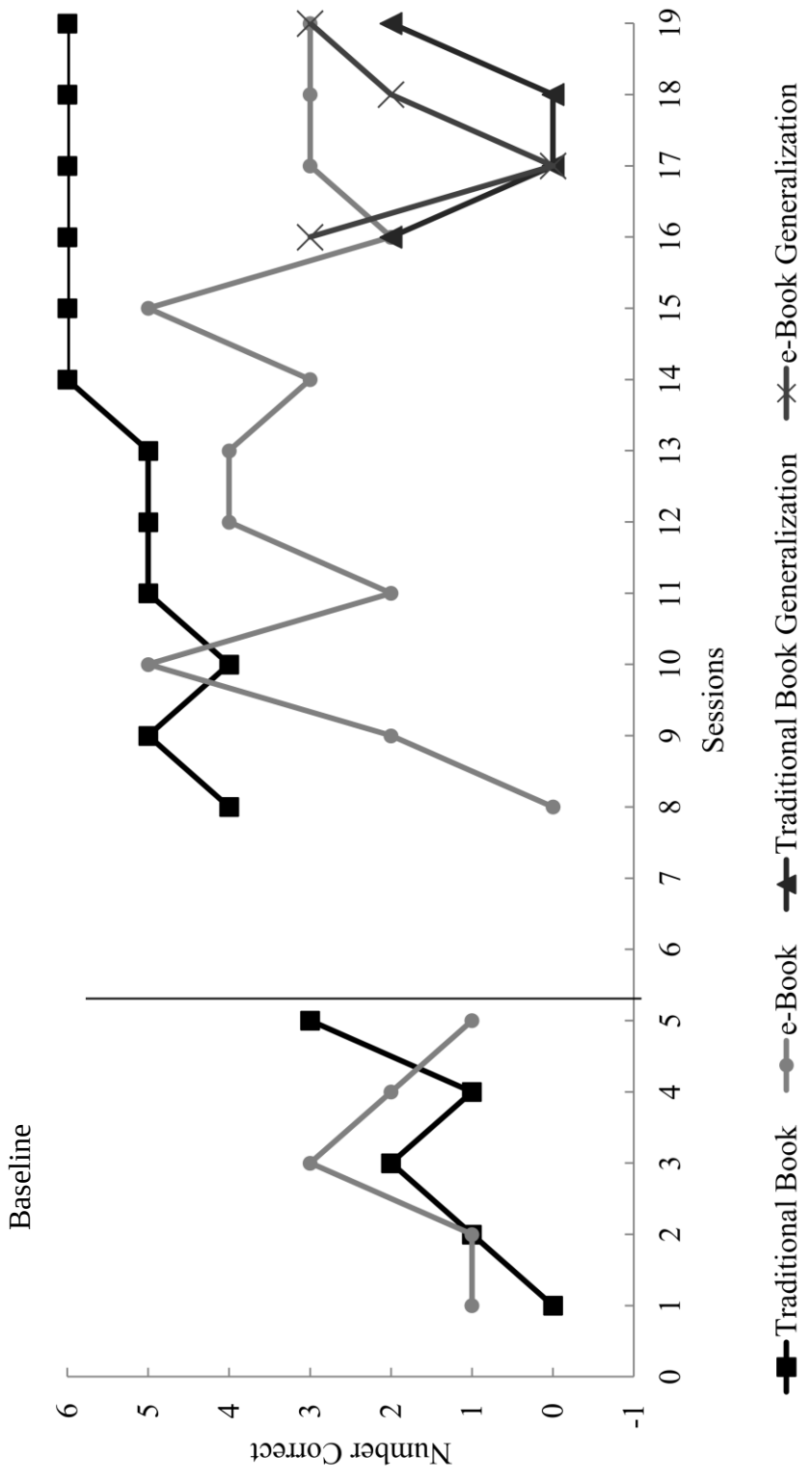

Figure 13. Benji's Weekly Receptive Probes, Book Types

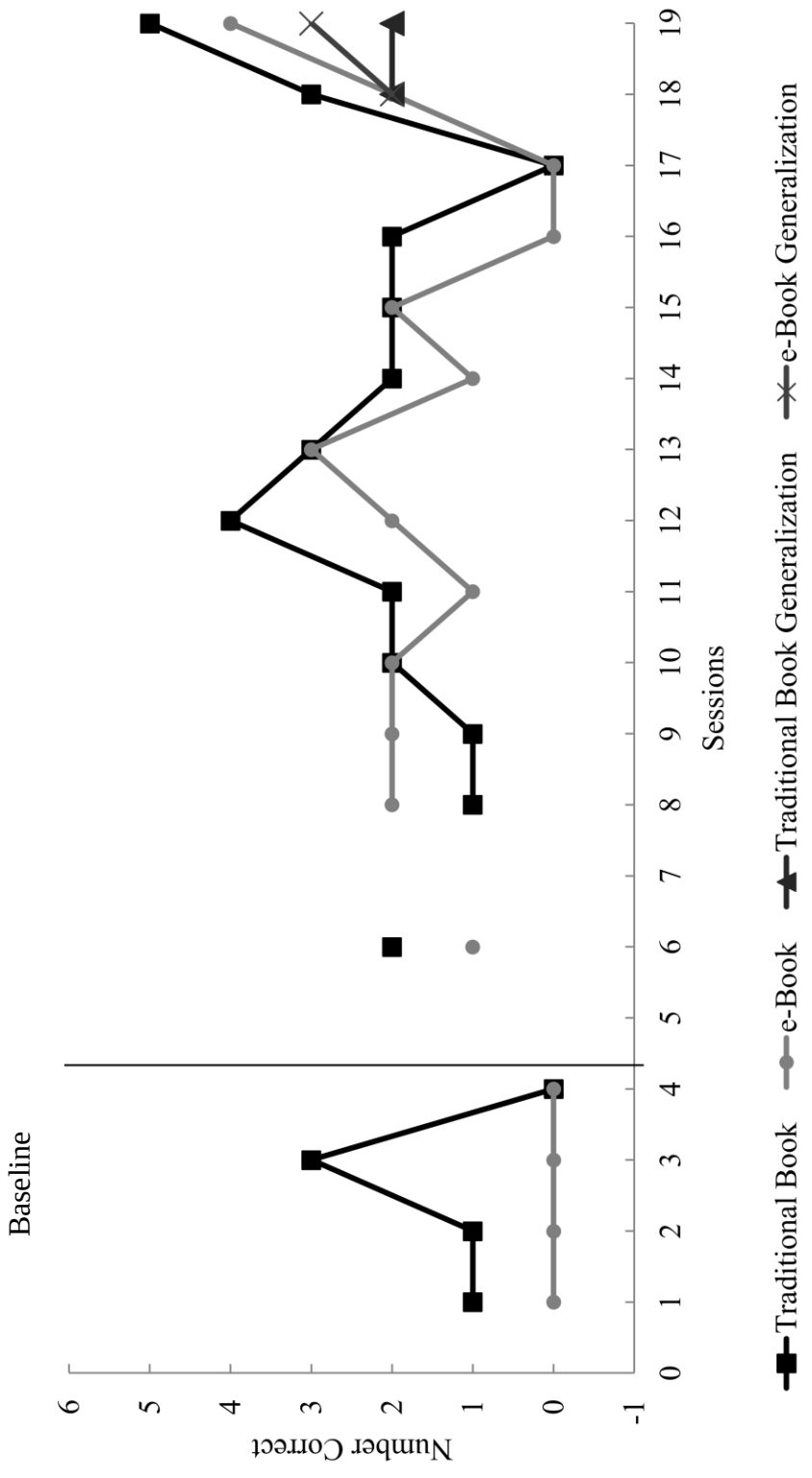

Figure 14. Nick's Weekly Receptive Probes, Book Types

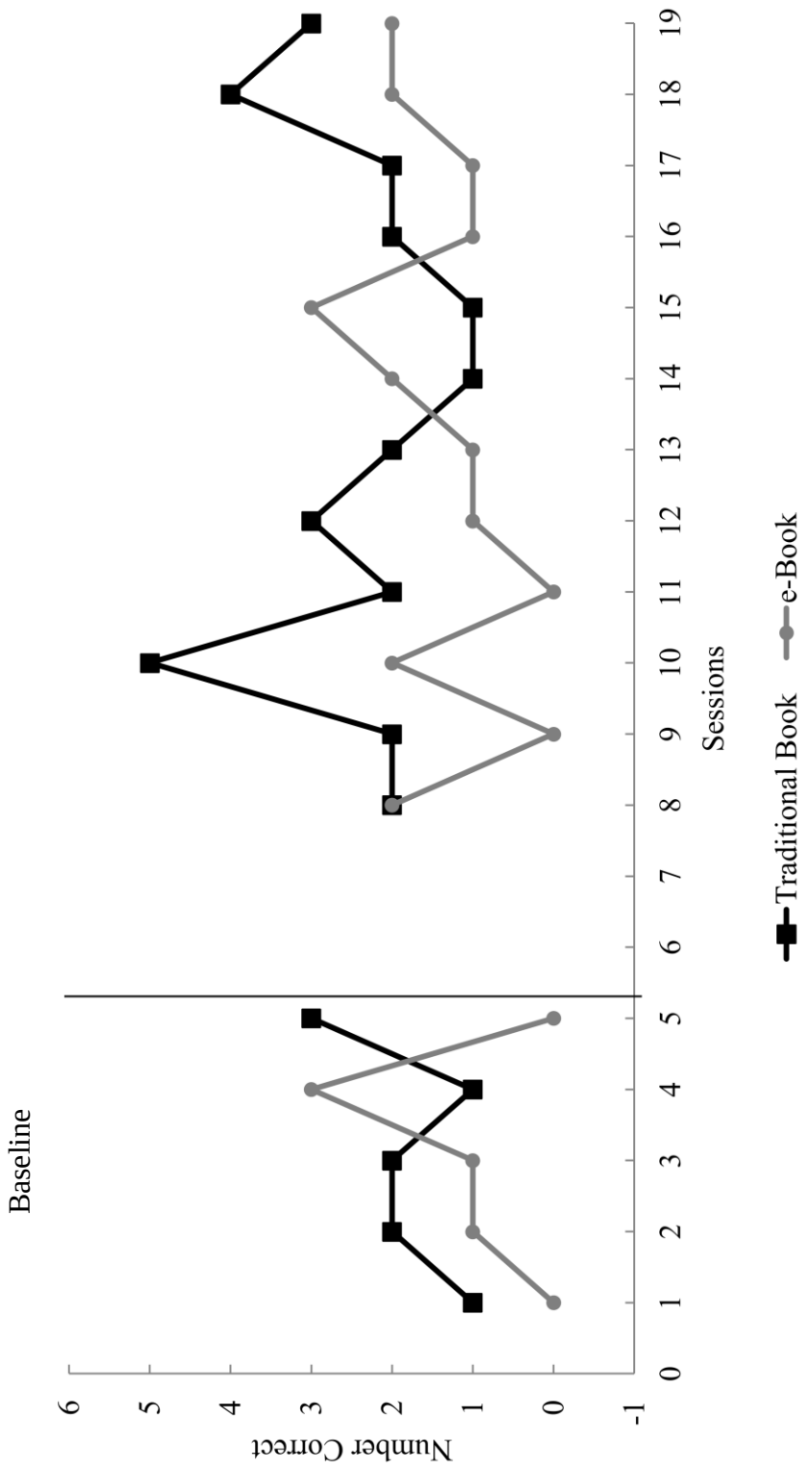

Figure 15. Jared's Weekly Receptive Probes, Book Types

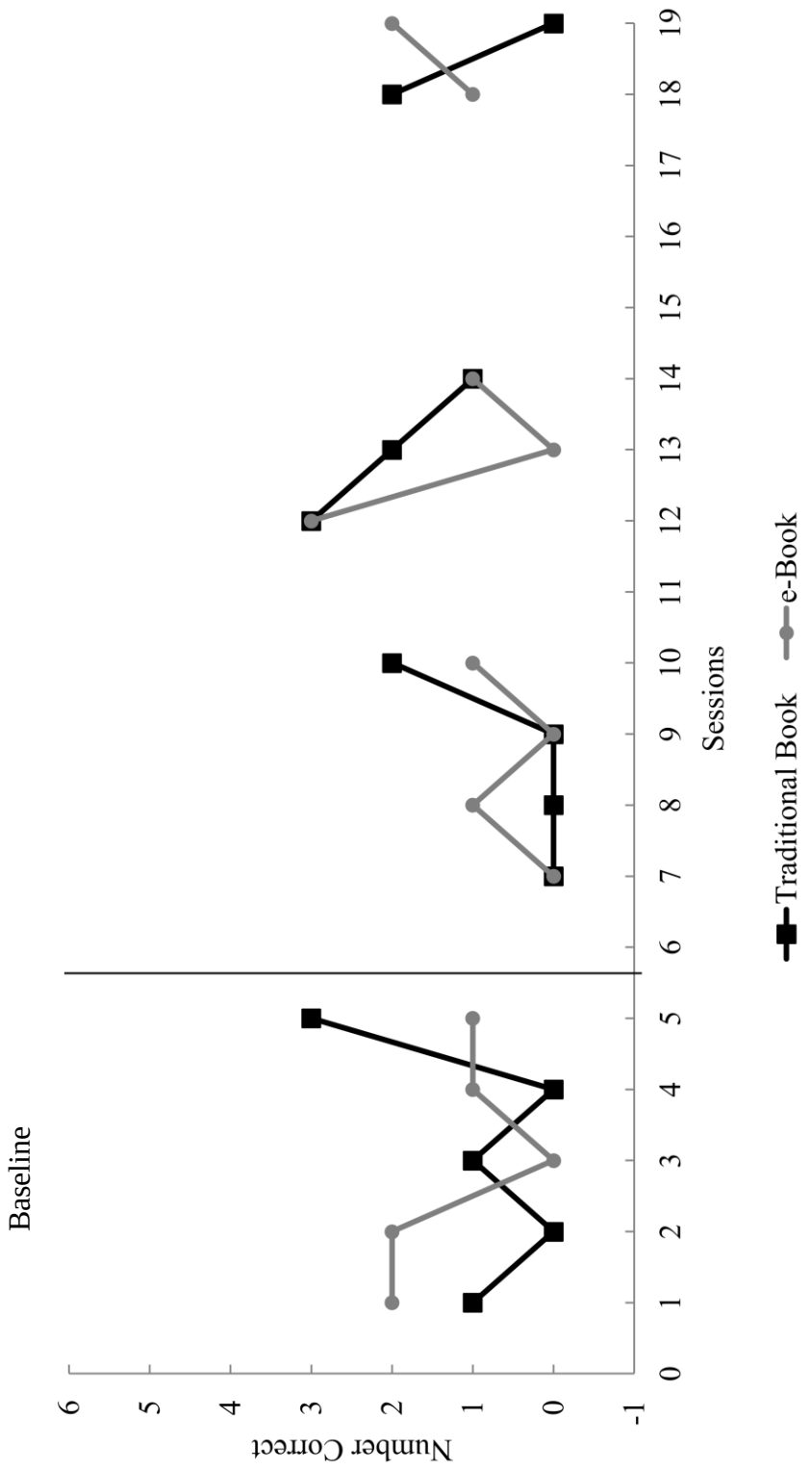

Figure 16. Tolani's Weekly Receptive Probes, Book Types

CHAPTER 4

DISCUSSION

This study sought to investigate the Vocabulary Learning through Books (VLTB) intervention procedure as a method for teaching vocabulary to children with disabilities in a shared book reading experience. In addition, the study sought to compare the VLTB procedure when conducted with an e-book versus a traditional book. An adapted alternating treatment single subject design was used to examine the research questions. Five children completed participation in the study. This chapter discusses the research questions and results, limitations, implications for practitioners and recommendations for future research.

Vocabulary Learning

According to the daily data probes, participating children were able to learn the specific vocabulary words that were targeted in this study. The children were explicitly taught to answer the definition question using the target words during the daily implementation data probe. The question was, "What word means [definition]?" For example, for the word "ratty" the question was, "What word means old and falling apart?" All children were able to learn the target words from this procedure, although not to defined criteria. The 5 participants also made measurable progress on the expressive weekly probes. Previous studies have shown that adult-child book reading can produce a

change in a child's vocabulary (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Justice, 2002; Justice, Meier & Walpole, 2005; Mol, Bus, de Jong, & Smeets, 2008; Sénéchal, 1997; Sénéchal & Cornell, 1993; Sénéchal, Thomas & Monker, 1995; Walsh & Blewitt, 2006; Wasik & Bond, 2001; Whitehurst, et al., 1988).

Only one previous study examined children with low vocabulary scores (Hargrave & Sénéchal, 2000). However, previous studies have not specifically included children with disabilities as the target participants of their study. The single subject design of this study also provided many probes for weekly data points, to better examine the growth of the vocabulary. Other studies have utilized a pre- and postmeasurement design, some with an extended maintenance measurement. Previous studies exposed children to the book from a range of 1 reading session to 5 weeks of reading conducted in home setting by parents (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Justice, 2002; Justice, Meier & Walpole, 2005; Mol, Bus, de Jong, & Smeets, 2008; Sénéchal, 1997; Sénéchal & Cornell, 1993; Sénéchal, Thomas & Monker, 1995; Walsh & Blewitt, 2006; Wasik & Bond, 2001; Whitehurst, et al., 1988). This study took place over 54 sessions or approximately 14 weeks.

Throughout this study only 3 children (Jose, Benji, and Nick) were successful in meeting daily intervention criteria. Two children (Jose and Benji) met receptive criteria on weekly probes. Two (Benji and Jared) were able to define words. Benji possibly learned to define target words due to his tendency to communicate using echolaia. The low number of children who met criteria questions whether the words were too difficult to learn. Because the children had disabilities as defined by being on an IEP, it may have been better to focus on Tier one words (Beck, McKeown, Kucan, 2002), which are

common everyday words, rather than Tier two words, which are higher level vocabulary words. The previously listed target word vocabulary studies, where students learned vocabulary, used words that could be considered Tier two words, including synonyms of common Tier one words (for example, "infant" for "baby"). However, the participants in these studies notably consisted of mostly typically developing children, while the current study focused on children with disabilities. In contrast, a recent study (Gray, Brinkley & Svetina, 2012) found that students with speech language impairments (SLI) had a clear advantage in learning difficult phonologic patterns and unfamiliar objects names over more familiar objects with more likely phonologic patterns. Their study used two-syllable nonwords, such as vugim and bedaeg, which could possibly be considered Tier three words because as nonwords they were completely unfamiliar. This raises the possibility that the target words for this study were not novel enough for children to learn quickly.

Another explanation for the difficulty children had in meeting the defined criteria of the study may be that the measures in this study were not sensitive enough to detect subtle changes in vocabulary. The weekly receptive and expressive probes were difficult tasks. Defining a vocabulary word is considered a definitive way to measure when a word is learned (Beck, McKeown, & Kucan, 2002). However, being able to define a word is a skill beyond vocabulary. Defining a word requires the language skills to understand what is being asked and to form the sentence (Snow, 1990). The weekly receptive probes required the children to be familiar to the testing procedure of picking an appropriate answer from a field of 4. This may have been especially a difficult task for children with disabilities. A more sensitive measurement or a measurement that examined transfer of

target words to a child's conversational speech may have shown faster and larger acquisition rates.

Intervention Phase Differences

Two different prompting strategies were utilized in this study during the VLTB intervention procedure. Intervention Phase I used least to most prompting. Two children (Jose and Benji) were successful in stating the target word when given the definition (daily implementation data) with this prompting strategy. One of the characteristics of both of these children was that they were able to maintain sustained attention to the prompting task. The other characteristic in common for these two children was that they memorized things more easily than the other participants. The least to most prompting strategy was a lengthy addition to the book reading when all four steps of the prompt were completed. It was easy for a student to become restless or distracted during the prompting procedure.

Three children (Nick, Jared and Tolani) were moved to Intervention Phase II. Two children (Nick and Tolani) had more accuracy in the daily implementation data for the simultaneous prompting. Immediately, Nick began to answer daily probes accurately when the simultaneous prompting was started. During 27 sessions of Intervention Phase I, Nick only answered two probes correctly. Tolani had more accuracy as measured by number of correct responses with Intervention Phase II than with Intervention Phase I. The simultaneous prompting was less disruptive to the book reading task. The simultaneous prompting seemed to provide an advantage as measured by number of correct responses, or accuracy in naming, for these children because the correction

procedure was less invasive. It cannot be conclusively determined that the prompting procedure was the reason for change, or if it was a result of order effect.

Comparison of the prompting strategies used in this study to other vocabulary teaching through adult-child storybook reading studies is not possible. The previous studies using questioning to teach vocabulary during adult-child storybook reading did not mention the correction procedure for children giving incorrect answers during the shared reading (Justice, 2002; Sénéchal, 1997; Sénéchal & Cornell, 1993; Sénéchal, Thomas & Monker, 1995; Wasik & Bond, 2001; Walsh & Blewitt, 2006). The dialogic reading method (Whitehurst, et al., 1988; Whitehurst, et al., 1994; Whitehurst & Lonigan, 1998) focuses on having a conversation about the book during reading and does not target learning specific vocabulary words. The dialogic reading method consists of asking "what" questions, asking open-ended questions and expanding on what the child says.

Traditional Books versus e-Books

This study did not find a clear advantage for type of book presentation for vocabulary learning. The 2 students (Jose and Benji) who were successful with least to most prompting learned the vocabulary from the traditional book faster than the e-book. One student (Tolani) had a greater rate of acquisition for the e-books after simultaneous prompting was started. The 2 other students (Nick and Jared) had mixed patterns of vocabulary growth with no clear difference in learning outcomes based on book type. The type of book that was most effective seemed to be student specific. It was expected that children would show more interest in the e-book because of its novel format and interactive appeal. This increased interest was expected to lead to a greater acquisition of vocabulary for the e-book over the traditional book. However, the opposite may have

occurred. The familiar format of the traditional book along with the absences of the interactive distractions of the e-book, seemed to show an advantage in learning for 2 of the students. As mentioned earlier, the students who first met criteria, were students who would sit and focus on the task with little additional help. Therefore, this type of book may have also appealed more to them. One of the students who met criteria was familiar with e-books and had a device at home, so the e-book was not novel. The other student was not familiar with e-books.

Previous studies of vocabulary learning using technology have also provided mixed results. Higgins and Cocks (1999), showed children were able to learn target words during a poem presented on CD ROM with animated cues. However, the study had many internal validity problems including not using nontarget words or a control group of a nontechnology or unanimated poems. Therefore, it was unable to compare technology and traditional learning methods. Moore and Calvert (2000) used only a simple flashcard drill, instead of embedded learning. The students with disabilities in this study showed a greater rate of learning with technology over traditional flashcards. The authors attributed this preference to the computer drills having attention-getting features. Another technology study (de Jong & Bus, 2002) compared a traditional book and e-book with students in the Netherlands similar to this current study. Their study also did not show an advantage for either type of book for child learning. Another comparison study examined the same book presented on the computer, 2 ways, 1 narrated on the computer, the other presented in a multimedia format (Verhallen, Bus, & de Jong, 2006). Comprehension was the target of the study. In this study the authors concluded the multi-media format increased the kindergarten's children's comprehension of the story. Current

results of studies show mixed results of any advantage in accuracy or efficacy in using technology for learning vocabulary.

Limitations

Design and Internal Validity

The single subject research Adapted Alternating Treatment Design allowed for simultaneous examination of the e-book and traditional book. This design assumes that the books and vocabulary are comparable. It was not possible to use the same traditional and e-book because at the time of the study there were not two books available that met the study criteria. It would have been better to have two identical books (with identical target vocabulary) counterbalanced between participants. For example, 1 child would have received book A as an e-book and book B as a traditional book, and child 2 would have book A as a traditional book and book B as an e-book, etc. This would have more precisely controlled the internal validity of the comparability of books and vocabulary.

This study intended to examine learning vocabulary in the context of adult-child shared book reading. However, the prompting strategies often interrupted the flow of reading. In order to optimize time and answer all target words, the reading was closely scripted. The presentation of the trials was interspersed with the plot of the book, which may have been a distraction to the learning task. The target words were in each book only once. This only allowed for 1 trial of each word on each day. The book reading context and the very limited number of trials a day may have contributed to the slow rate of word learning. Although the books were read multiple times so the children had many trials, this also may have been a limitation. Some children expressed displeasure at reading the same books over and over again. As the study progressed, children would access the

hotspots in the book less and less, which indicated the novelty of the technology was waning. The same task presented daily for nearly 14 weeks may have caused children to pay less attention to the task over time and would not be a practice that would typically be implemented in preschool classrooms.

Generalizability

Due to the school year ending and slow acquisition rate for 3 of the 5 participants, there was not time to fully explore generalization. None of the students met criteria for defining words. Only 3 (Jose, Benji and Nick) of the 5 participants met criteria on daily implementation data and began receptive generalization probes. If acquisition had occurred more quickly, generalization could have more carefully assessed. Limited generalization might be expected due to teaching only 1 exemplar for each vocabulary word in the context of the book. Generalization results for participants were higher than expected considering this limitation.

The research in the area of technology as a tool for teaching vocabulary through books is preliminary. Technology is constantly changing. Results of this study are only interpretable for the technology available now. The e-book used in this study was chosen from only a few e-books that met book criteria for the study. As technology changes and progresses, and e-books become more available and interactive, results of the comparison of an e-book with a traditional book may change. It is also not known if the results obtained with the two books used in this study would be replicated with another set of books. A different e-book and traditional book may show a different or clearer effectiveness or efficiency for child vocabulary learning.

Implications for Practitioners

The results of this study conclude that the VLTB procedure caused participants to be able to answer definition questions asking the child to name the target word and receptively to point to target vocabulary words. Practitioners could easily implement the VLTB question asking and prompting procedure into the classroom book reading sessions. The VLTB procedure could be implemented in the classroom one on one, in small groups, or large group book reading activities. Before reading a book, a traditional or e-book, the practitioner could choose target words for words that appear multiple times in the book and target definitions based on the criteria of this study. The criteria includes that the target word is unlikely to be known to the children, and is pictured in the book. Practitioners could use the procedure for Tier one, two and three words (Beck, McKeown, Kucan, 2002) while reading. As the book is read the practitioner would follow Intervention Phase I or II of the VLTB procedure. The practitioner would ask the question, "What word means [definition]?" then use an appropriate prompt procedure to teach the target vocabulary. As evidenced by the social validity measurements, teachers and assistants agreed that the VLTB procedure could be implemented in the classroom. The procedure itself is simple. Reading the same book multiple times is recommended because it allows a child to become more familiar with the plot of the story, characters, and vocabulary (Ezell & Justice, 2005), which can lead to deeper discussion. Future professional development instruction and coaching could be provided to teach practitioners to implement the procedure in the classroom setting. The training should specifically teach how to choose words and develop an age appropriate definition, in addition to the actual VLTB procedure.

Although the VLTB procedure was successful in producing change in children's vocabulary, the variability in results reflect that children with disabilities may need more trials or opportunities to interact with vocabulary to learn. Children, especially with disabilities, are typically active learners. Reading a book is an activity requires sitting with attention to an adult and the task. Using adult-child shared storybook reading exclusively as a vocabulary teaching technique may not be best for children with disabilities. Practitioners should consider combining the VLTB procedure with other embedded learning activities to teach vocabulary. For example, having props for children to interact and retell the story, or having the children act out the vocabulary during the story.

Recommendations for Future Research

There are many areas of future research to investigate based on the results of this study. First, the type of prompting strategy warrants further investigation. If the study was started with the simultaneous prompt, what changes in the outcome might occur? Many students may be more successful if simultaneous prompting, or another single prompt procedure, is used because it is more efficient to learning than least to most prompting (Bailey & Wolery, 1993; Wolery, Ault, & Doyle, 1992). If students are more successful, they may reach criteria more quickly. This may allow for better analysis of any learning advantage over a book type. If criteria are reached sooner, generalization may also be better studied, as more time will be available. For example, in addition to different pictures used for receptive generalization probes by the investigator, the probes could have been conducted by another person, such as the child's teacher. Also, another location outside the classroom could have been used to ask the generalization probes. A

larger participant sample should also be examined. Because of the mixed results of book preference, a larger sample may show a specific preference or reinforce the finding of this study that vocabulary learning through adult-child shared storybook reading is individual.

Additionally, further research should be conducted to determine how effective adult-child shared storybook reading is for teaching vocabulary to children with disabilities. This study produced some gains in vocabulary for participating children with disabilities. Perhaps adult-child shared storybook reading is not the best strategy for some preschool age children with disabilities or are there certain subsets of children with disabilities that the VLTB procedure is especially suited for. Further research should be conducted to answer these questions.

The 3 children who were moved to Intervention Phase II showed more difficulty attending to the reading task than other participants. Other vocabulary studies did not mention that attention to the error correction procedure was a factor in outcome. In general, simultaneous prompting is considered more efficient to learning because the learning is near errorless. However, the least to most prompting strategy is less intrusive and can produce faster acquisition compared to prompting which restricts error making during learning (Bailey & Wolery, 1992; Libby, Weiss, Bancroft, & Ahearn, 2008; Wolery, Ault, & Doyle, 1992; Wolery, & Hemmeter, 2011).

The presentation of the VLTB procedure may be adapted as well. Using different words or more common vocabulary words may be easier and more meaningful for children to learn through the VLTB procedure. Conversely, using more rare or novel words may be less functional but easier to learn. Another adaptation may be a book that

has less plot, words or pages so the book itself is not a distraction to the target vocabulary words. Finding a book that had more than one presentation of the target vocabulary words would also provide more practice and may help all children reach criteria and met criteria sooner.

Finally, because the VLTB procedure was effective in teaching vocabulary, a combination of VLTB and an embedded explicit instruction could be investigated. Embedded instruction refers to teaching in a natural setting, and following the child's lead. Explicit refers to specific instruction directed by an interventionist. The idea of an embedded explicit instruction emphasizes an approach where direct instruction is embedded throughout the day in high-quality daily classroom interactions (Justice & Kaderavek, 2004; Spencer, Goldstein, Sherman, Noe, Tabbah, Ziolkowski, & Schneider, 2012). By combining the procedures the child would have more interaction with the vocabulary word. This may result in faster rate of acquisition for target vocabulary words.

Conclusion

This study examined if the VLTB procedure could be used to teach vocabulary to children with disabilities. It also sought to examine if there was a difference between using the VLTB procedure with a traditional book and e-book. The VLTB procedure did produce changes in vocabulary, as measured by daily implementation data which consisted of children being able to name a word given the definition. Nevertheless, daily implementation data showed varied efficiency and accuracy across children. Further research should focus on prompting procedures, using different tier vocabulary words, and combining reading with embedding learning in the classroom. Additional research

should also be conducted to determine if adult-child shared storybook reading alone is an effective teaching strategy for children with disabilities.

This study did not answer the question of which type of book was more successful in teaching vocabulary using the VLTB procedure. The preliminary conclusion is that efficiency and accuracy in learning specific vocabulary words and preference for book type depends on the individual student. Different types of prompting produced different results in learning; as well as different types of book produced different learning rates. The children also had a difficult time transferring the knowledge gained from daily implementation of the VLTB procedure to the weekly receptive and expressive probes. It seems technology can be a tool to be used to enhance learning, but this preliminary study shows mixed results as to its accuracy and efficiency in teaching vocabulary using the VLTB procedure. Researchers and practitioner seem eager to embrace new technology to help children learn. Technology, as part of our daily lives, is here to stay (NAEYC, 2012). Research should continue to focus on the best applications for technology as a tool for learning and in the area of using shared storybook reading with children with disabilities to increase language skills.

Adult-child shared storybook reading is a way to teach many emergent literacy skills, including vocabulary. Emergent literacy is a major component of early childhood classroom curriculums, and the VLTB procedure is one additional technique for practitioners to use with children with disabilities. The VLTB procedure is simple to implement during daily reading in preschool classrooms. It requires choosing vocabulary words and their definition, asking the definition question during reading, and providing an error correction procedure. Literacy is an important skill for daily life. Children with

disabilities are especially at risk for literacy difficulties. Research should continue to address ways to close the literacy gap between children with and without disabilities.

APPENDIX A

VOCABULARY LEARNING THROUGH BOOKS (VLTB)

INTERVENTION PHASE I SCRIPT

1. Introduce yourself to the child. Use as much time as needed to make the child feel comfortable. Ask child to join you in the reading area to read the two books.

2. Start with first book chosen for the day (see schedule below). Read text as written, adding questions after reading the sentence containing the target word. Point to picture of target word when asking question. Use gestures as appropriate when reading target word in text.

3. Minimize interruptions during reading by reading written text and following VLTB intervention procedure below. When reading the e-book Sunny Farm, allow the child to access hotspots, these are marked with a speaker icon, as the participant desires after the entire page is read. Let child decide when to turn the page for either book.

Vocabulary and Questions	
Book: Owen	
handkerchief	What word means a small cloth you wipe your face with?
Stuffed	What word means to push something quickly into a small place?
Ratty	What word means it is old and falling apart?
e-Book: Sunny Farm	
Stable	What word means a building that horses live in?
Mucky	What word means sticky and slimy mud?
Sneaked	What word means to move quietly and not been seen?

Reinforcement:

1. Ask question. If child answers correct, give verbal reinforcement (i.e., **"Right, that's the correct word."**) and continue reading. If incorrect proceed to correction procedure.

Correction procedure:

2. Ask question and give the answer as a sentence.

   "What word means a small cloth you wipe your face with?
   Handkerchief means a small cloth used for wiping your face."

3. Ask question again. If child answers correct, give verbal reinforcement (i.e., **"Right, that's the correct word."**) continue reading. If incorrect, proceed to 4.
4. Ask question again, give one word answer, and ask child to repeat answer.
   "What word means a small cloth you wipe your face with? Handkerchief. Say 'Handkerchief.'"
   Give verbal reinforcement **"Right, handkerchief means a small cloth used for wiping your face."**

Reading Schedule:

1st day start with Owen first, then alternate from then on

APPENDIX B

VOCABULARY LEARNING THROUGH BOOKS (VLTB) INTERVENTION

PHASE I DAILY IMPLEMENTATION DATA SHEET

Participant Code:_____ Date:_____ Interventionist Code: _____

Sunny Farm

Target Word	Correct	Correct with prompt	Correct with model	Error	Notes
Stable					
Mucky					
Sneaked					

Owen

Target Word	Correct	Correct with prompt	Correct with model	Error	Notes
Stuffed					
Ratty					
handkerchief					

APPENDIX C

VOCABULARY LEARNING THROUGH BOOKS (VLTB)

INTERVENTION PHASE II PROCEDURAL SCRIPT

Before reading either book:

- Prompt Session
    - Ask question for each target word
    - Ask in order written
    - Ask question verbally only (no actions or picture prompts)
    - Feedback: Correct = verbal praise; Incorrect = no response
    - Questions:
        - What word means a building animals live in? (stable)
        - What word means sticky, slimy mud? (mucky)
        - What word means to move quietly and not be seen? (sneaked)
        - What word means to push quickly into a small space? (stuffed)
        - What word means old and falling apart? (ratty)
        - What word means a small cloth used to wipe your face? (handkerchief)

While reading book:

- Instructional Session
    - Read stories in correct order for the day
    - After the sentence containing the target word is read, ask the question (same questions as Invention Phase I)
        - Obtain child's attention before asking question
        - Point to picture of target word
        - Use actions to illustrate target word
    - Immediately after question, say correct response
    - Feedback
        - Correct (child repeats target word) = verbal praise (and edible or sticker, if child desires)

Incorrect = no response (continue reading)

APPENDIX D

VOCABULARY LEARNING THROUGH BOOKS (VLTB) INTERVENTION

PHASE II DAILY IMPLEMENTATION DATA SHEET

Participant Code:_____ Date:_____
Interventionist Code: _____

Sunny Farm

Target Word	probe (before reading)	prompted correct	prompted error	Error (e.g., word given, NR)	Notes
Stable					
Mucky					
Sneaked					

Owen

Target Word	probe (before reading)	prompted correct	prompted error	Error (e.g., word given, NR)	Notes
Stuffed					
Ratty					
handkerchief					

APPENDIX E

VOCABULARY LEARNING THROUGH BOOKS (VLTB)

PROBES FOR WEEKLY DATA SHEETS EXAMPLE

Expressive: Ask participant: "What does [target word] mean?"

Words	Correct	Incorrect	Error
handkerchief			
Twisted			
Stuffed			
Plunger			
essential			
Ratty			
Mucky			
Stable			
Stroke			
Grubby			
Reporter			
sneaked			

Receptive: Show three foils and target cards. Ask participant: "Point to [target word]."

Words	Correct	Incorrect	Error
handkerchief			A B C D
Twisted			A B C D
Stuffed			A B C D
Plunger			A B C D
essential			A B C D
Ratty			A B C D
Mucky			A B C D
Stable			A B C D
Stroke			A B C D
Grubby			A B C D
Reporter			A B C D
sneaked			A B C D

APPENDIX F

VOCABULARY LEARNING THROUGH BOOKS (VLTB)

TEACHER/ASSISTANT SOCIAL VALIDITY

QUESTIONAIRE

1. To what extent did the VLTB intervention package produce change in the child's overall vocabulary?

1	2	3	4	5
no/little change		moderate change		large change

2. To what extent did the VLTB intervention package produce change in knowledge of the child's target vocabulary?

1	2	3	4	5
no/little change		moderate change		large change

3. To what extent was the VLTB intervention package easy to implement in the classroom setting?

1	2	3	4	5
very difficult		moderately difficult		very easy

4. To what extent was the VLTB intervention package an interruption to the typical classroom routine?

1	2	3	4	5
no interruption		moderate interruption		much interruption

5. To what extent is the VLTB intervention package a valid method to teach vocabulary?

1	2	3	4	5
not a valid method		moderately valid method		very valid method

6. Would you be interested in learning to use the VLTB package to teach vocabulary?
Other comments about VLTB intervention package:

APPENDIX G

VOCABULARY LEARNING THROUGH BOOKS (VLTB) PROCEDURAL

FIDELITY AND INTEROBSERVER AGREEMENT

WEEKLY PROBES

Expressive: Ask participant: “What does [target word] mean?”

Words	Correct	Incorrect	Error	No or neutral reinforcement
stroke				
grubby				
sneaked				
stable				
mucky				
reporter				
handkerchief				
stuffed				
suddenly				
plunger				
essential				
ratty				

Receptive: Lay out three foils and target cards. Ask participant: “Point to [target word].”

Words	Correct	Incorrect	Error	No or neutral reinforcement
stroke				
grubby				
sneaked				
stable				
mucky				
reporter				
handkerchief				
stuffed				
suddenly				
plunger				
essential				
ratty				

APPENDIX H

VOCABULARY LEARNING THROUGH BOOKS (VLTB) PROCEDURAL

FIDELITY AND INTEROBSERVER AGREEMENT

INTERVENTION PHASE I

Participant Code:_____ Date:_____ Interventionist Code: _____

Sunny Farm

Target Word	Correct	Correct after full prompt	Correct after model (repeated)	Error	Correct prompting procedure
stable					
mucky					
sneaked					

Owen

Target Word	Correct	Correct after full prompt	Correct after model (repeated)	Error	Correct prompting procedure
stuffed					
ratty					
handkerchief					

4. Ask/Invite child to join and read books. Book One: yes/no Book Two: yes/no

5. Start with first book chosen for the day.

Book One: yes/no	Book Two: yes/no

6. Ask correct question for target word at the end of the sentence containing target word.

Book One: yes/no	Book Two: yes/no

7. When reading the e-book Sunny Farm, allow the child to access hotspots.

Sunny Farm: yes/no

APPENDIX I

VOCABULARY LEARNING THROUGH BOOKS (VLTB) PROCEDURAL

FIDELITY AND INTEROBSERVER AGREEMENT

INTERVENTION PHASE II

Participant Code:_____ Date:_____ Interventionist Code: ___

PROBE	+/-	Notes
stable		
mucky		
sneaked		
stuffed		
ratty		
handkerchief		

Sunny Farm

Target Word	prompted correct or error	Feedback correct? (correct = praise error = ignore)	Error (e.g., word given, NR)	Notes
stable				
mucky				
sneaked				

Owen

Target Word	prompted correct or error	Feedback correct? (correct = praise error = ignore)	Error (e.g., word given, NR)	Notes
stuffed				
ratty				
handkerchief				

1. Ask/Invite child to join and read books.

Book One: yes/no	Book Two: yes/no

2. Start with first book chosen for the day.

Book One: yes/no	Book Two: yes/no

3. Ask correct question for target word at the end of the sentence containing target word.

Book One: yes/no	Book Two: yes/no

4. When reading the e-book Sunny Farm, allow the child to access hotspots.

Sunny Farm: yes/no

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